



Advanced Excel

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About the Tutorial

Advanced Excel is a comprehensive tutorial that provides a good insight into the latest and advanced features available in Microsoft Excel 2013. It has plenty of screenshots that explain how to use a particular feature, in a step-by-step manner.

Audience

This tutorial has been designed for all those readers who depend heavily on MS-Excel to prepare charts, tables, and professional reports that involve complex data. It will help all those readers who use MS-Excel regularly to analyze data.

Prerequisites

The readers of this tutorial are expected to have a good prior understanding of the basic features available in Microsoft Excel.

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Table of Contents

About the Tutorial	i
Audience.....	i
Prerequisites.....	i
Copyright & Disclaimer	i
Table of Contents	ii
PART 1: EXCEL NEW FEATURES	1
1. Excel – Chart Recommendations	2
Change in Charts Group.....	2
Chart Recommendations	3
Fine Tune Charts Quickly	5
Select / De-select Chart Elements	6
Format Style	7
Format Color.....	8
Filter Data being displayed on the Chart.....	9
2. Excel – Format Charts	12
Format Axis.....	12
Provision for Combo Charts.....	15
3. Excel – Chart Design	17
Ribbon of Chart Tools	17
Quick Layout.....	19
Change Colors.....	20
Chart Styles.....	20
Switch Row / Column	21
Select Data.....	22
Change Chart Type	23
Move Chart.....	24
4. Excel – Richer Data Labels	26
Formatting Data Labels	26
Look of the Data Labels	30
Shape of a Data Label	31
Resize a Data Label	32
Add a Field to a Data Label	32
5. Excel – Leader Lines	35
Add a Leader Line	35
Format Leader Lines	36
6. Excel – New Functions.....	38
Functions by Category	38
New Functions in Excel 2013	39
User Defined Functions in Add-ins	42
Web Functions.....	42

PART 2: FUNDAMENTAL DATA ANALYSIS	43
7. Instant Data Analysis	44
Quick Analysis Features	44
Quick Analysis of Data	44
Conditional Formatting	46
Charts	50
Totals	52
Tables	58
Sparklines	60
8. Excel – Sorting Data by Color	62
9. Excel – Slicers.....	65
10. Excel – Flash Fill	68
PART 3: POWERFUL DATA ANALYSIS – INTRODUCTION	72
11. Excel – PivotTable Recommendations.....	73
Create a PivotTable to analyze external data	74
Connect to a new external data source.....	76
Using the Field List option	78
PivotTables based on Multiple Tables	82
PART 4: POWERFUL DATA ANALYSIS – 1	85
12. Excel – Data Model in Excel.....	86
Explore Data Using PivotTable	89
Create Relationship between Tables.....	91
13. Excel – Power Pivot.....	95
Data Model using Calculated Columns.....	99
Relationship using calculated columns.....	103
14. Excel – External Data Connection.....	105
Update the Data Connections	106
Automatically Refresh Data.....	107
Automatically refresh data at regular intervals.....	109
Enable Background Refresh.....	109
15. Excel – Pivot Table Tools	111
Source Data for a PivotTable	111
Change to a Different External Data Source.....	112
Delete a PivotTable.....	114
Using the Timeline	117
Use a Timeline to Filter by Time Period.....	119
Create a Standalone PivotChart	122

PART 5: POWERFUL DATA ANALYSIS – 2	124
16. Excel – Power View	125
Create a Power View Sheet	125
17. Excel – Visualizations	129
Create Charts and other Visualizations	129
Visualization – Matrix	130
Visualization – Card	131
Visualization – Charts	132
18. Excel – Pie Charts	138
Bubble and Scatter Charts	140
Maps	143
Multiples: A Set of Charts with the Same Axes	145
Visualization – Tiles	147
19. Power View – Additional Features	150
Modify the internal Data Model	150
20. Excel – Power View in Services.....	155
Key Performance Indicators (KPIs)	155
Hierarchies.....	156
Drill-Up and Drill-Down	157
21. Excel – Format Reports	161
Hyperlinks.....	173
Printing	173
Support for right-to-left languages.....	173
22. Excel – Handling Integers	176
Power Query.....	177
Power BI Desktop	178
PART 6: OTHER FEATURES.....	181
23. Excel – Templates	182
24. Excel – Inquire.....	186
Ensure Inquire Add-in is Active.....	186
Compare Two Workbooks	188
25. Excel – Workbook Analysis.....	194
Diagrams.....	198
Workbook Relationship	199
Worksheet Relationship	200
Cell Relationship	201
Clean Excess Cell Formatting	203
26. Excel – Manage Passwords.....	205
Embed Worksheet Data in a Web Page.....	207

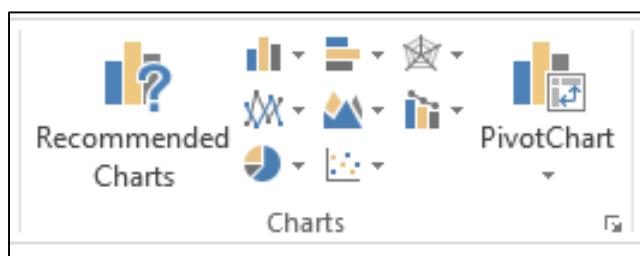
27. Excel – File Formats.....	208
Save a Workbook in another File Format	208
Excel File Formats.....	208
Text File Formats	209
Other File Formats.....	210
File Formats that Use the Clipboard	213
File Formats not Supported in Excel 2013	214
28. Excel – Discontinued Features.....	215
Discontinued / Changed features	215
Save Workspace	215
New from Existing	215
Save as Template.....	216
Split Box Control.....	219
Blank Workbook	220
Save Options.....	221
Microsoft Clip Organizer.....	222
MS Office Picture Manager	222
Exit option	222
Browser View Options	224
Individual Data Series	225
Pyramid and Cone Chart Types	225

Part 1: Excel New Features

1. Excel – Chart Recommendations

Change in Charts Group

The Charts Group on the Ribbon in MS Excel 2013 looks as follows:



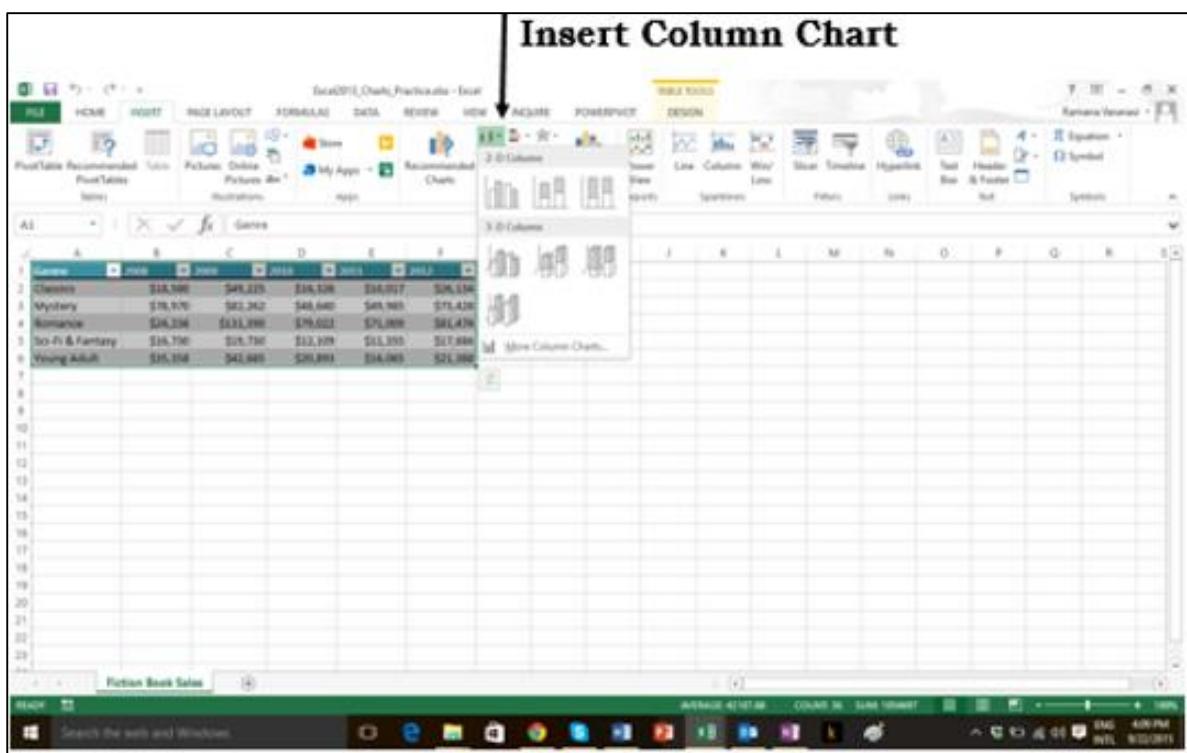
You can observe that:

- The subgroups are clubbed together.
- A new option '**Recommended Charts**' is added.

Let us create a chart. Follow the steps given below.

Step 1: Select the data for which you want to create a chart.

Step 2: Click on the **Insert Column Chart** icon as shown below.



When you click on the **Insert Column chart**, types of **2-D Column Charts**, and **3-D Column Charts** are displayed. You can also see the option of More **Column Charts**.

Step 3: If you are sure of which chart you have to use, you can choose a Chart and proceed.

If you find that the one you pick is not working well for your data, the new **Recommended Charts** command on the **Insert** tab helps you to create a chart quickly that is just right for your data.

The screenshot shows the Microsoft Excel ribbon with the 'INSERT' tab selected. In the 'CHARTS' group, there is a 'Recommended Charts' button. Below the ribbon, a data table is visible with columns labeled 2008 through 2012 and rows 1 through 6. The data is as follows:

	2008	2009	2010	2011	2012
1	\$18,580	\$49,225	\$16,326	\$10,017	\$26,134
2	\$78,970	\$82,262	\$48,640	\$49,985	\$73,428
3	\$24,236	\$131,390	\$79,022	\$71,009	\$81,474
4	\$16,730	\$19,730	\$12,109	\$11,355	\$17,686
5	\$35,358	\$42,685	\$20,893	\$16,065	\$21,388
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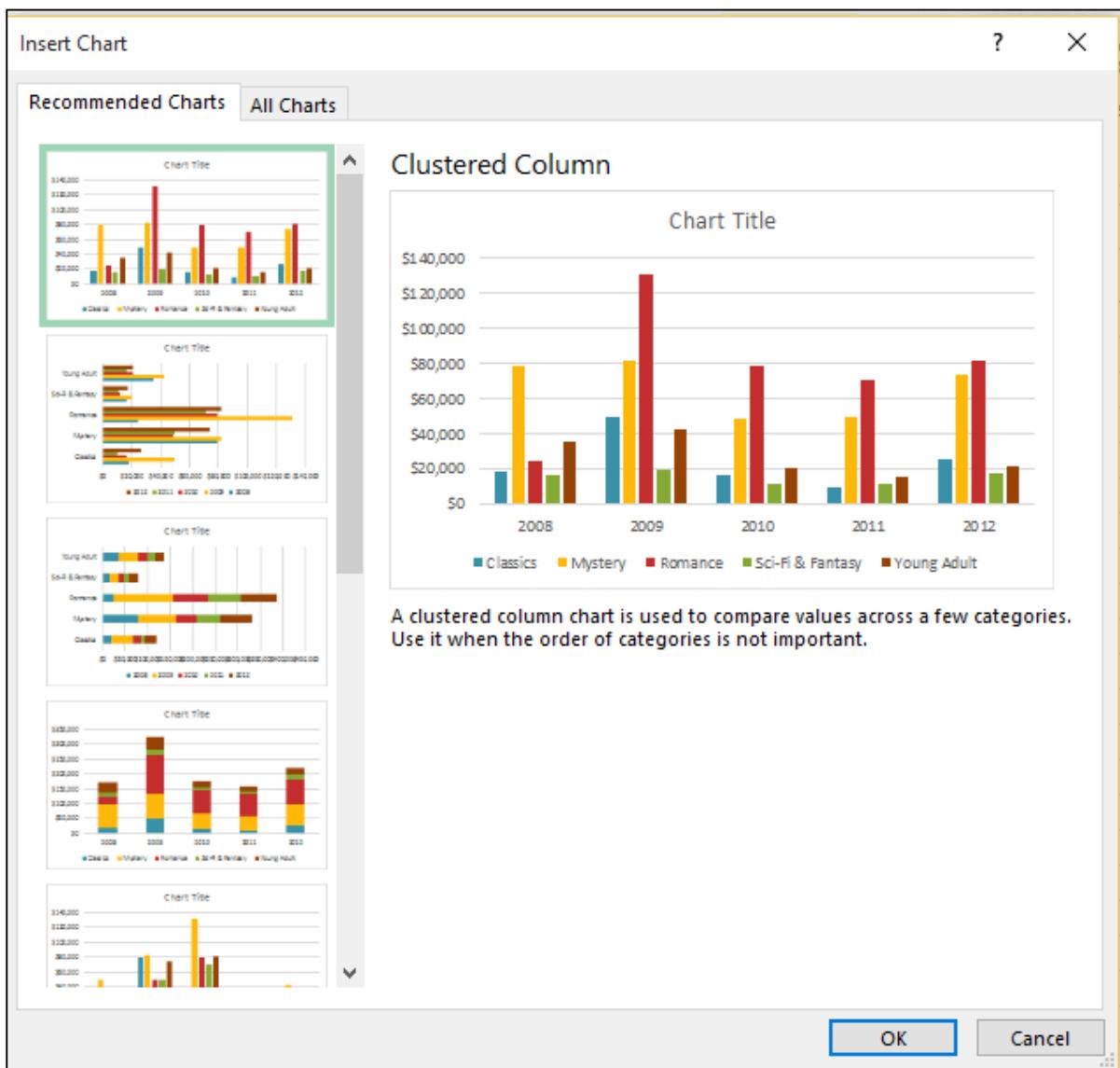
Chart Recommendations

Let us see the options available under this heading. (use another word for heading)

Step 1: Select the Data from the worksheet.

Step 2: Click on **Recommended Charts**.

The following window displaying the charts that suit your data will be displayed.



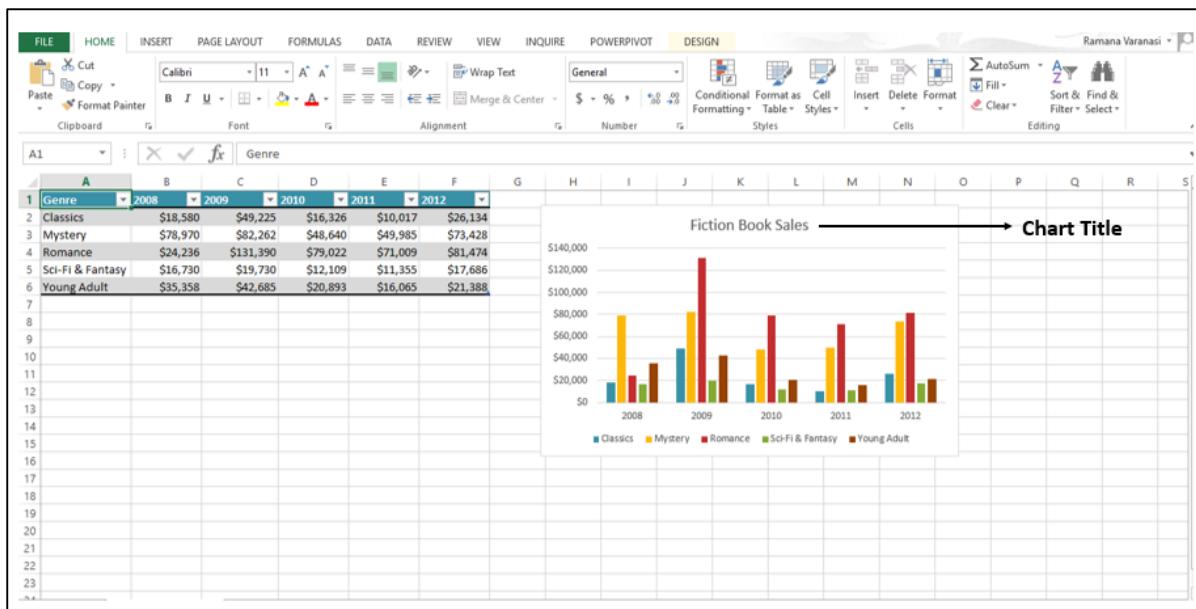
Step 3: As you browse through the **Recommended Charts**, you will see the preview on the right side.

Step 4: If you find the chart you like, click on it.

Step 5: Click on the **OK** button. If you do not see a chart you like, click on **All Charts** to see all the available chart types.

Step 6: The chart will be displayed in your worksheet.

Step 7: Give a **Title** to the chart.



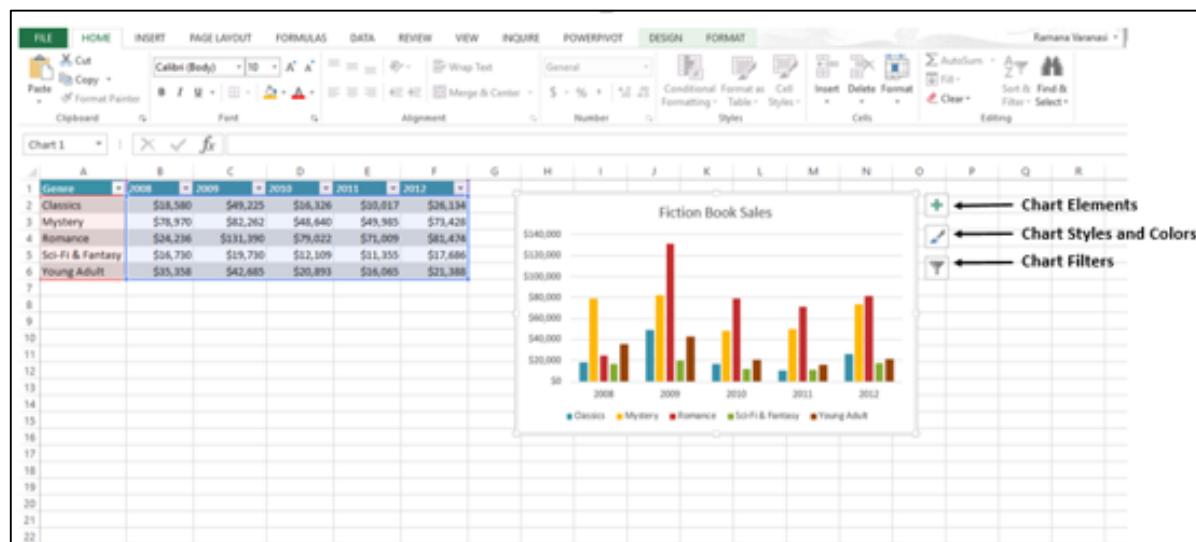
Fine Tune Charts Quickly

Click on the Chart. Three Buttons appear next to the upper-right corner of the chart. They are:

- Chart Elements
- Chart Styles and Colors, and
- Chart Filters

You can use these buttons-

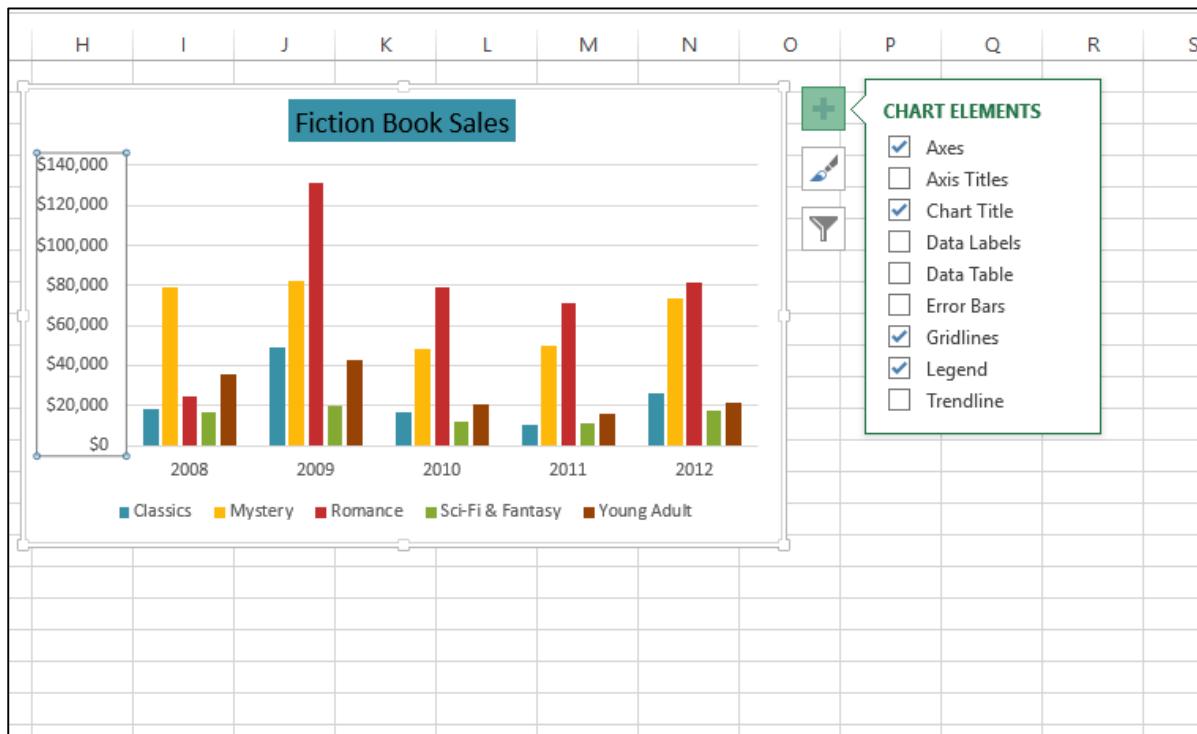
- To add chart elements like axis titles or data labels
- To customize the look of the chart, or
- To change the data that's shown in the chart



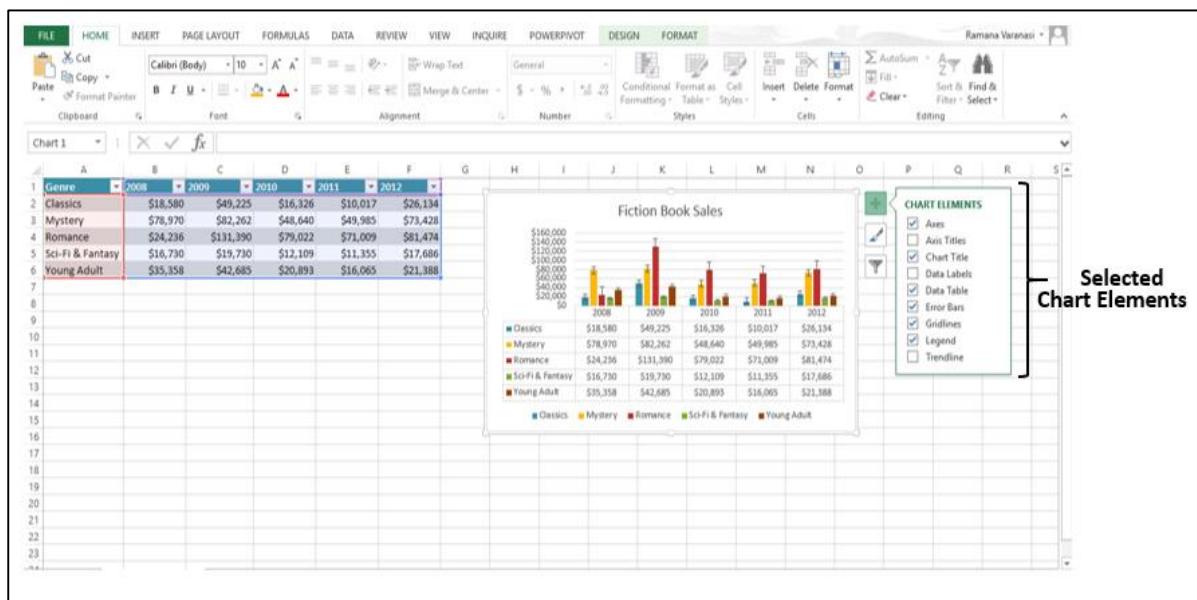
Select / De-select Chart Elements

Step 1: Click on the Chart. Three Buttons will appear at the upper-right corner of the chart.

Step 2: Click on the first button **Chart Elements**. A list of chart elements will be displayed under the **Chart Elements** option.



Step 3: Select / De-select **Chart Elements** from the given List. Only the selected chart elements will be displayed on the Chart.

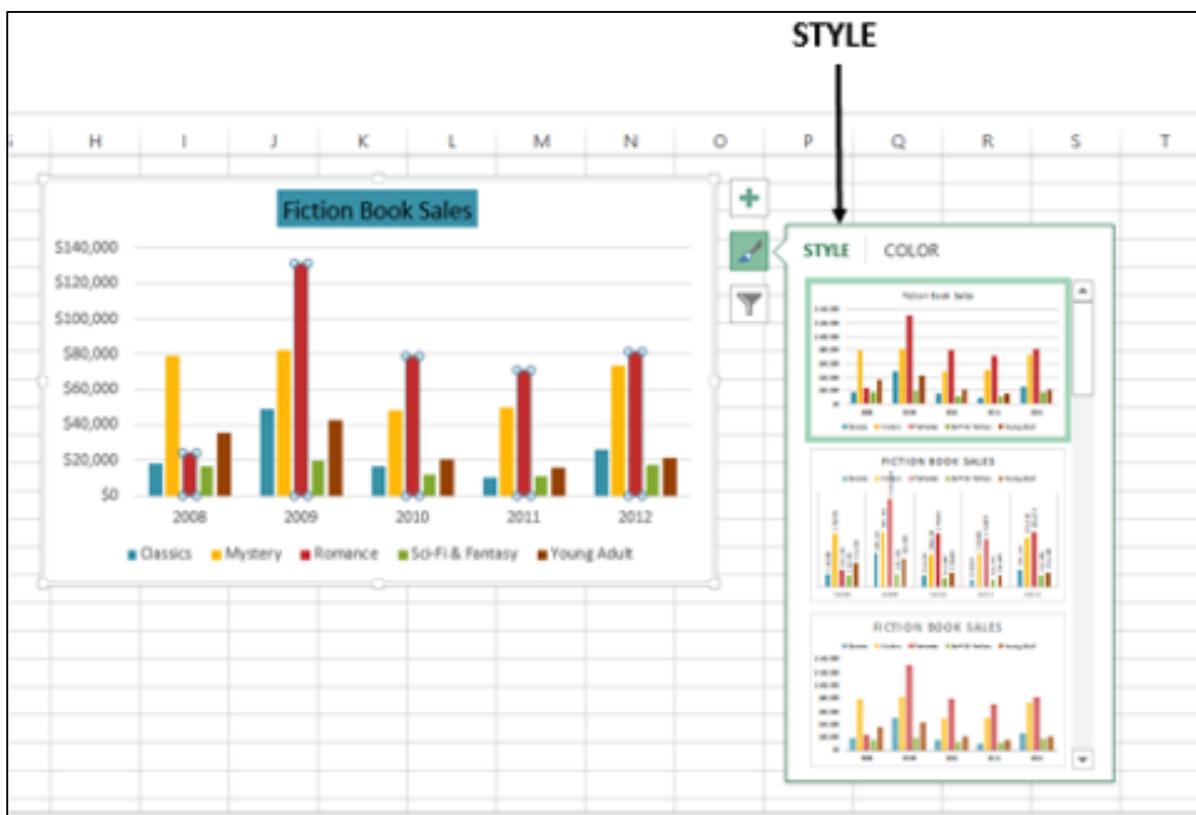


Format Style

Step 1: Click on the **Chart**. Three Buttons will appear at the upper-right corner of the chart.

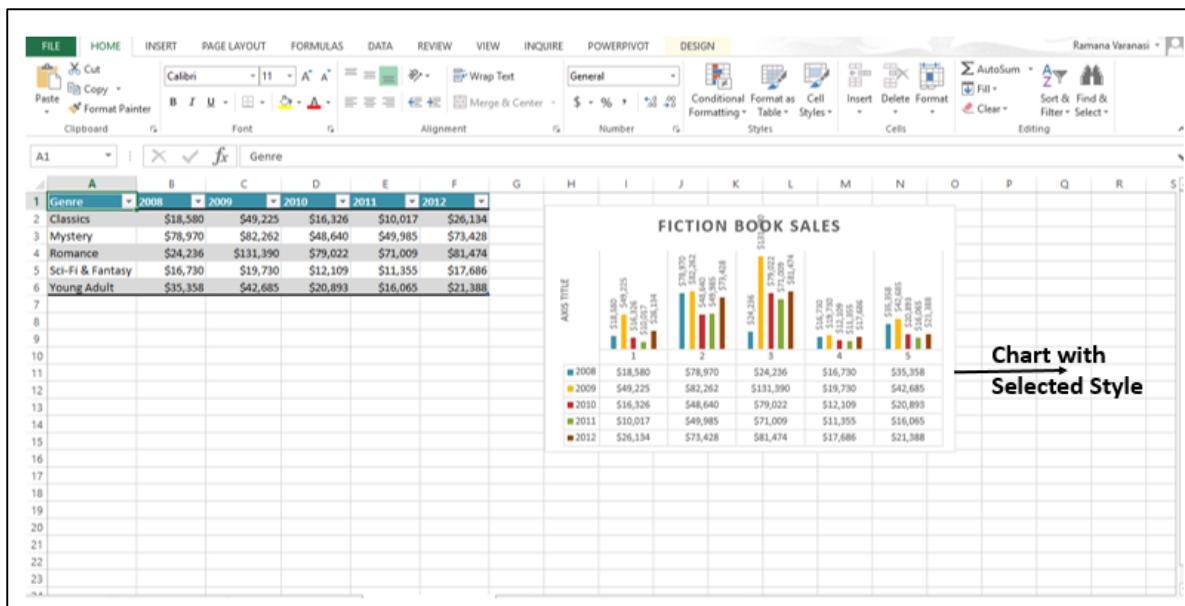
Step 2: Click on the second button **Chart Styles**. A small window opens with different options of **STYLE** and **COLOR** as shown in the image given below.

Step 3: Click on **STYLE**. Different options of Style will be displayed.



Step 4: Scroll down the gallery. The live preview will show you how your chart data will look with the currently selected style.

Step 5: Choose the Style option you want. The Chart will be displayed with the selected Style as shown in the image given below.

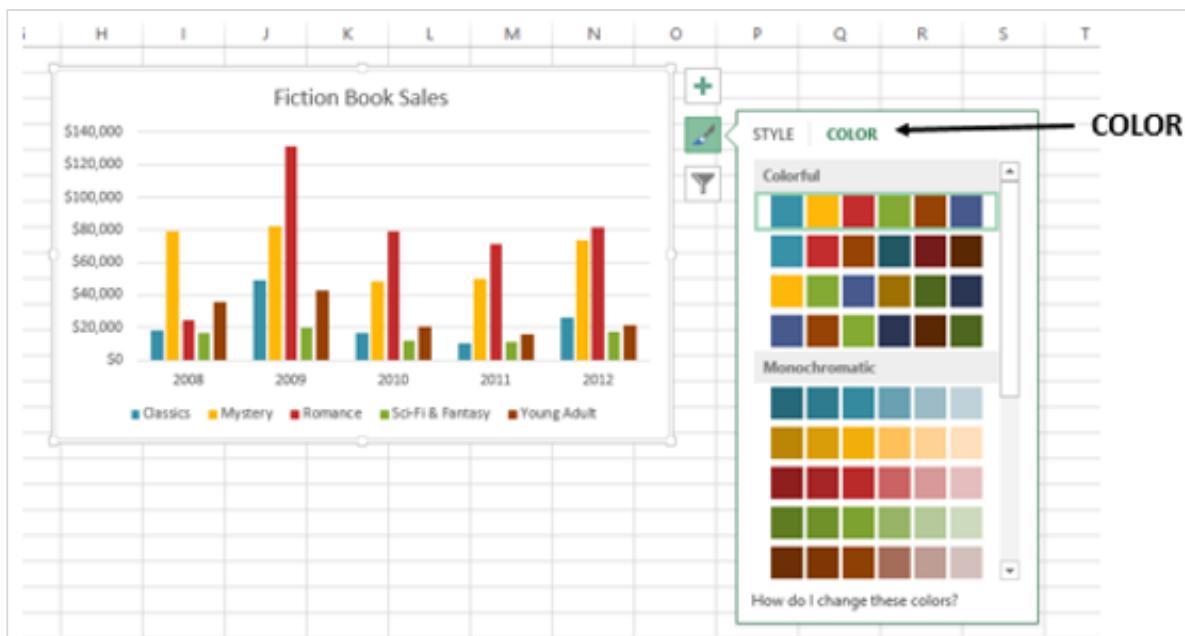


Format Color

Step 1: Click on the **Chart**. Three Buttons will appear at the upper-right corner of the chart.

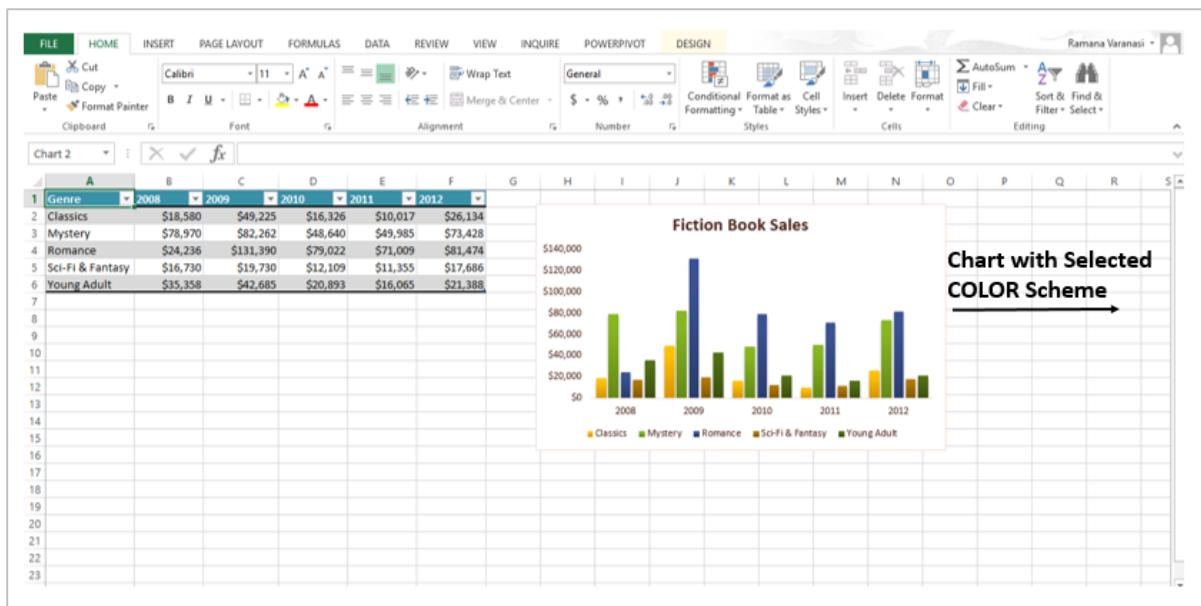
Step 2: Click on Chart Styles. The **STYLE** and **COLOR** window will be displayed.

Step 3: Click on the **COLOR** tab. Different Color Schemes will be displayed.



Step 4: Scroll down the options. The live preview will show you how your chart data will look with the currently selected color scheme.

Step 5: Pick the color scheme you want. Your Chart will be displayed with the selected Style and Color scheme as shown in the image given below.



You can change color schemes from Page Layout Tab also.

Step 1: Click the tab **Page Layout**.

Step 2: Click on the **Colors** button.

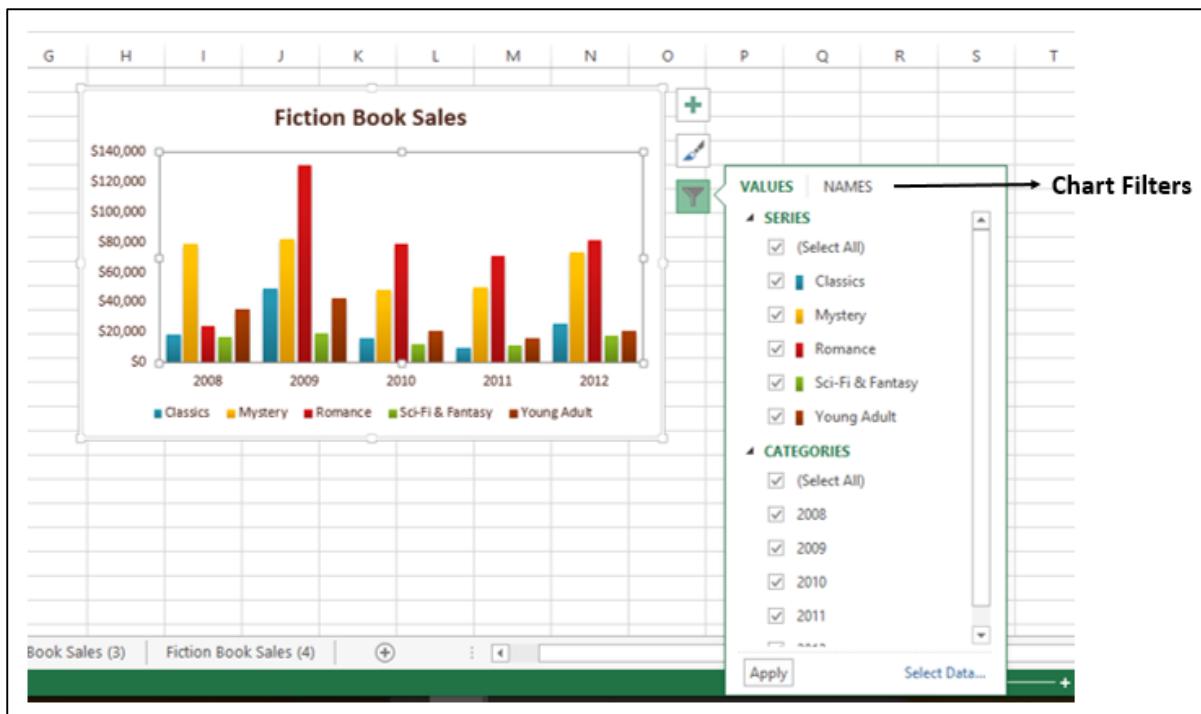
Step 3: Pick the color scheme you like. You can also customize the Colors and have your own color scheme.

Filter Data being displayed on the Chart

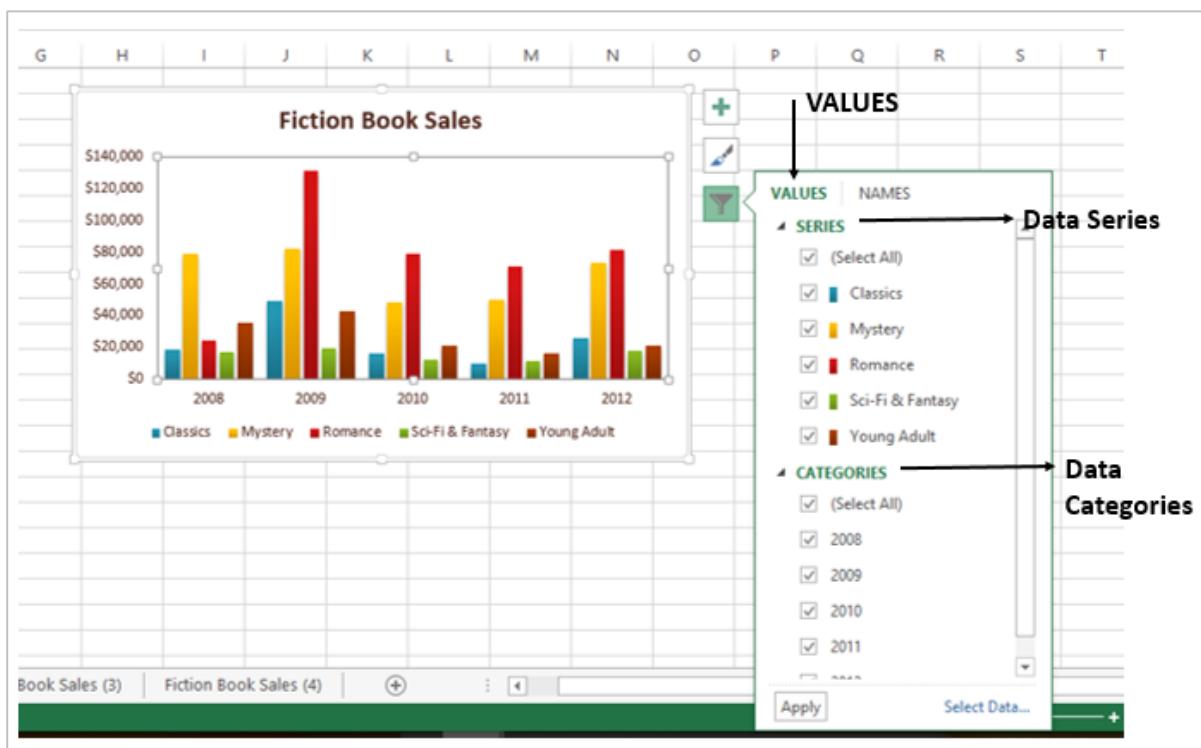
Chart Filters are used to edit the data points and names that are visible on the chart being displayed, dynamically.

Step 1: Click on the Chart. Three Buttons will appear at the upper-right corner of the chart.

Step 2: Click on the third button **Chart Filters** as shown in the image.

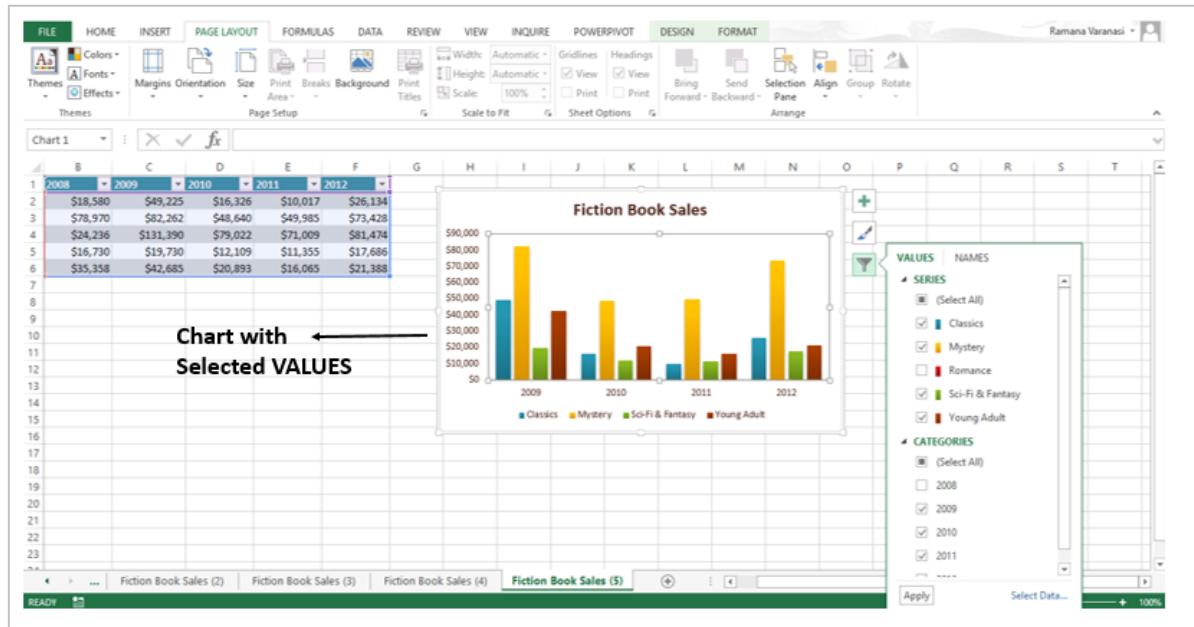


Step 3: Click on **VALUES**. The available **SERIES** and **CATEGORIES** in your Data appear.



Step 4: Select / De-select the options given under **Series** and **Categories**. The chart changes dynamically.

Step 5: After, you decide on the final Series and Categories, click on Apply. You can see that the chart is displayed with the selected data.



2. Excel – Format Charts

The **Format** pane is a new entry in Excel 2013. It provides advanced formatting options in clean, shiny, new task panes and it is quite handy too.

Step 1: Click on the Chart.

Step 2: Select the chart element (e.g., data series, axes, or titles).

Step 3: Right-click the chart element.

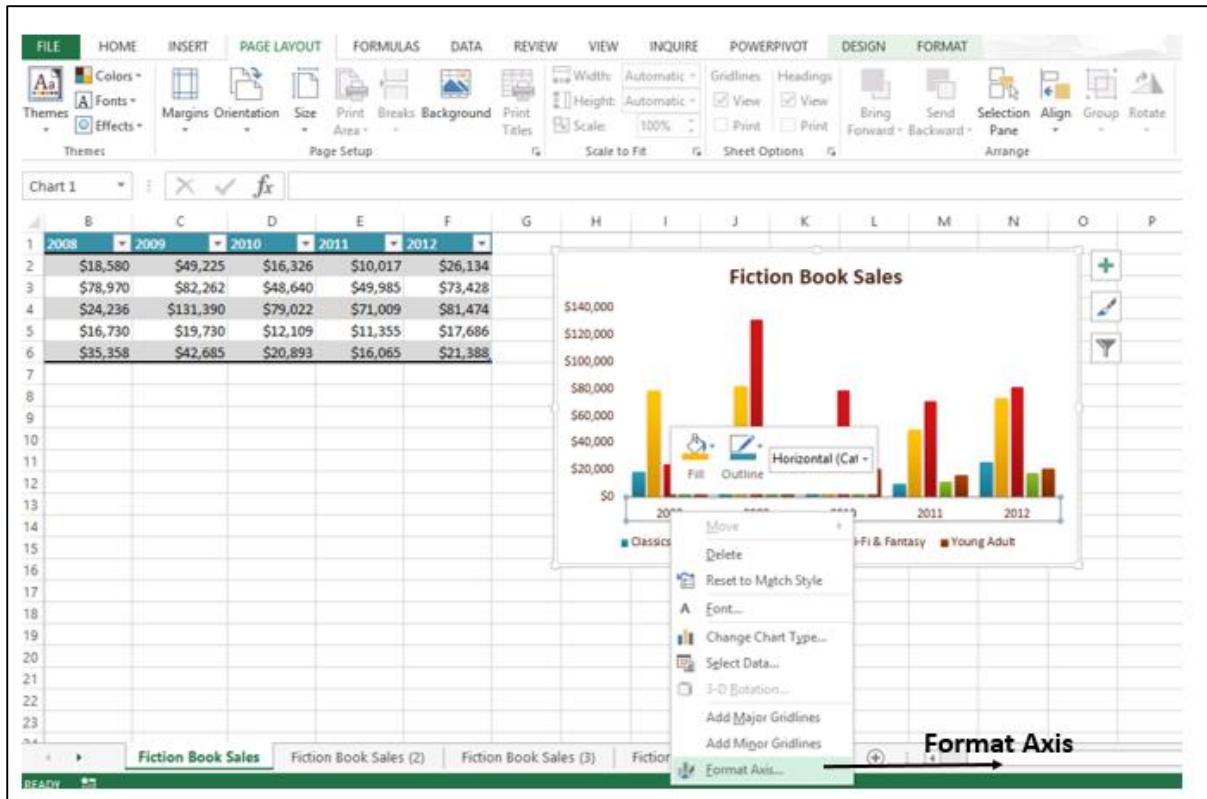
Step 4: Click **Format <chart element>**. The new **Format** pane appears with options that are tailored for the selected chart element.

Format Axis

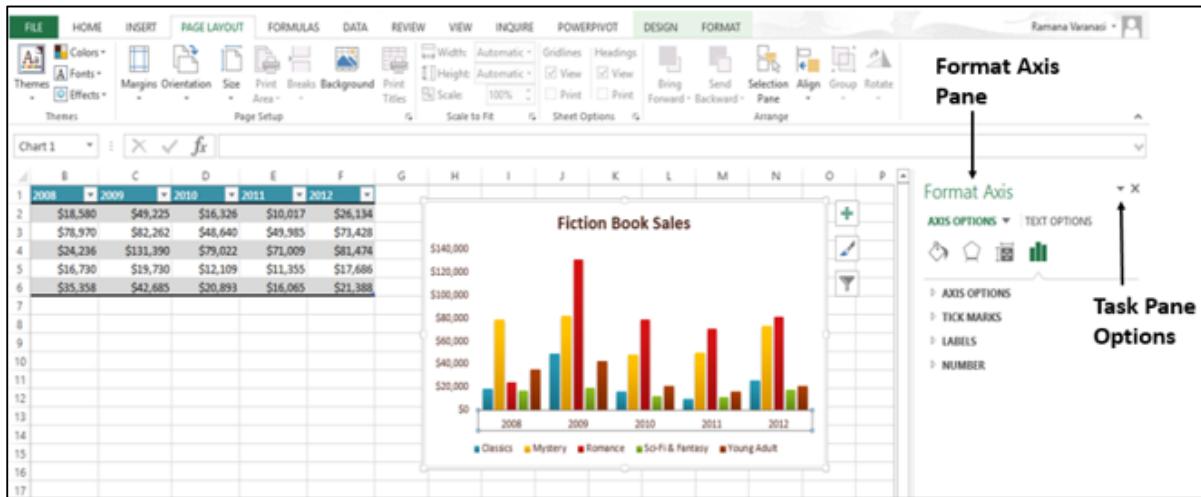
Step 1: Select the **chart axis**.

Step 2: Right-click the chart axis.

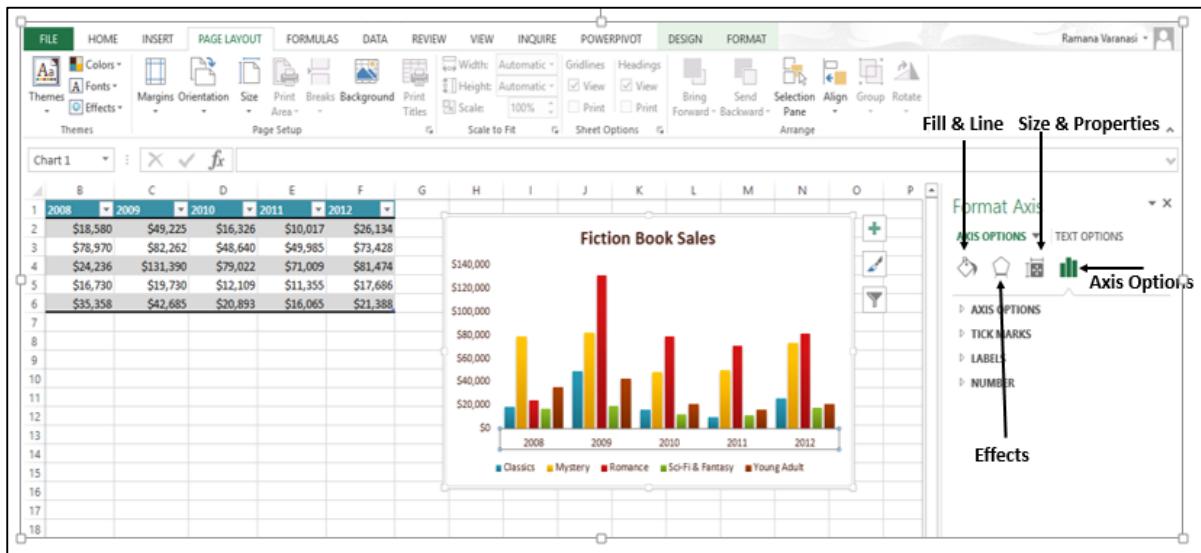
Step 3: Click **Format Axis**. The **Format Axis** task pane appears as shown in the image below.



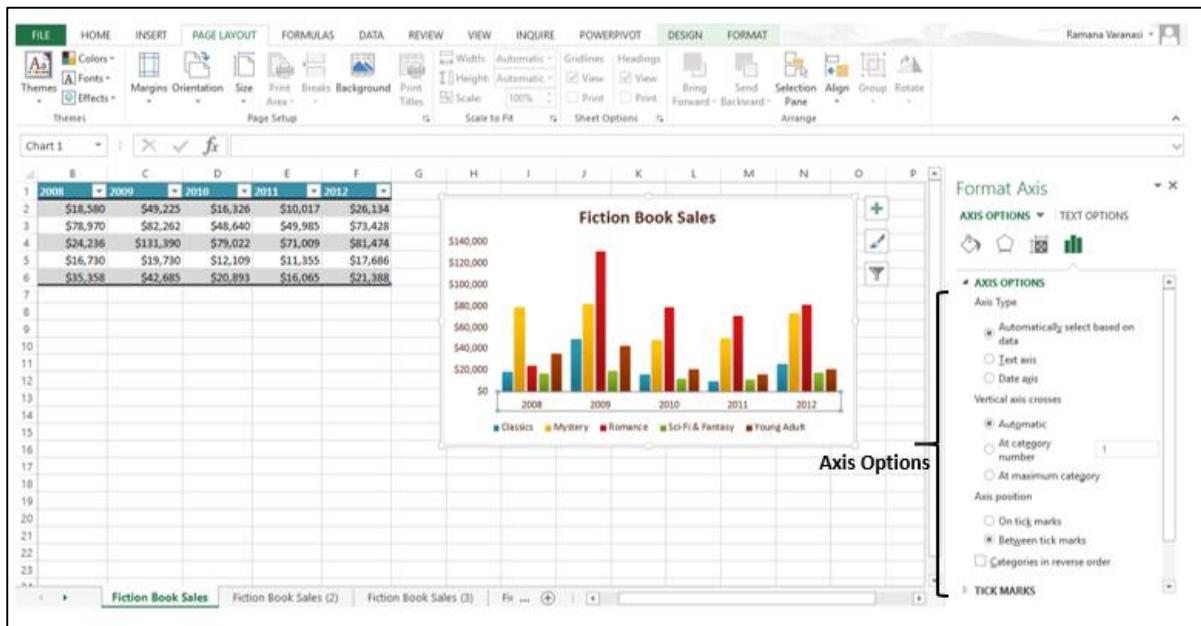
You can move or resize the task pane by clicking on the **Task Pane Options** to make working with it easier.



The small icons at the top of the pane are for more options.

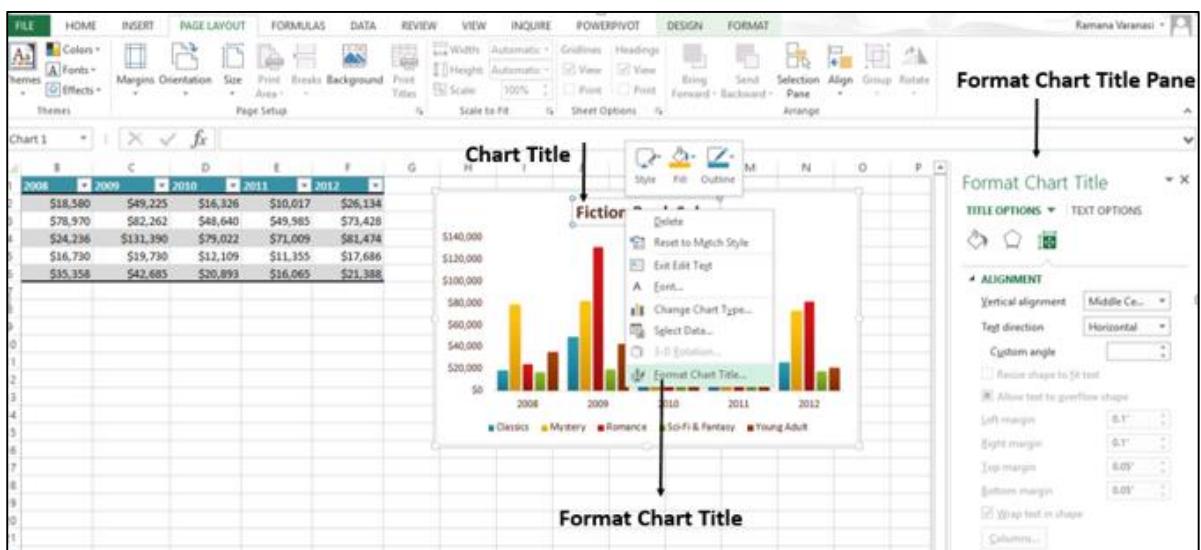


Step 4: Click on **Axis Options**.



Step 5: Select the required **Axis Options**. If you click on a different chart element, you will see that the task pane automatically updates to the new chart element.

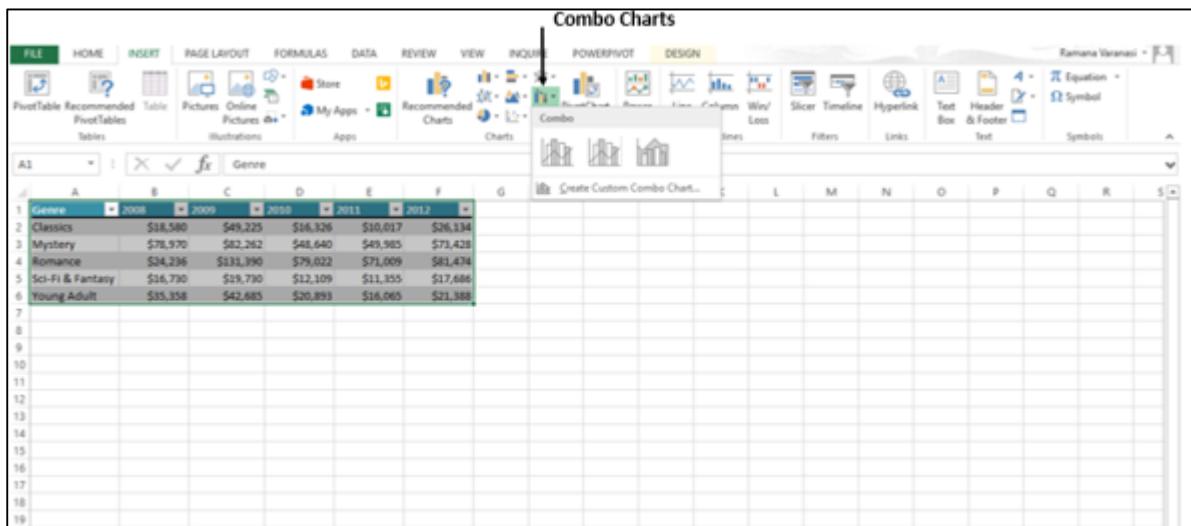
Step 6: Select the **Chart Title**.



Step 7: Select the required options for the **Title**. You can format all the Chart Elements using the **Format Task Pane** as explained for **Format Axis** and **Format Chart Title**.

Provision for Combo Charts

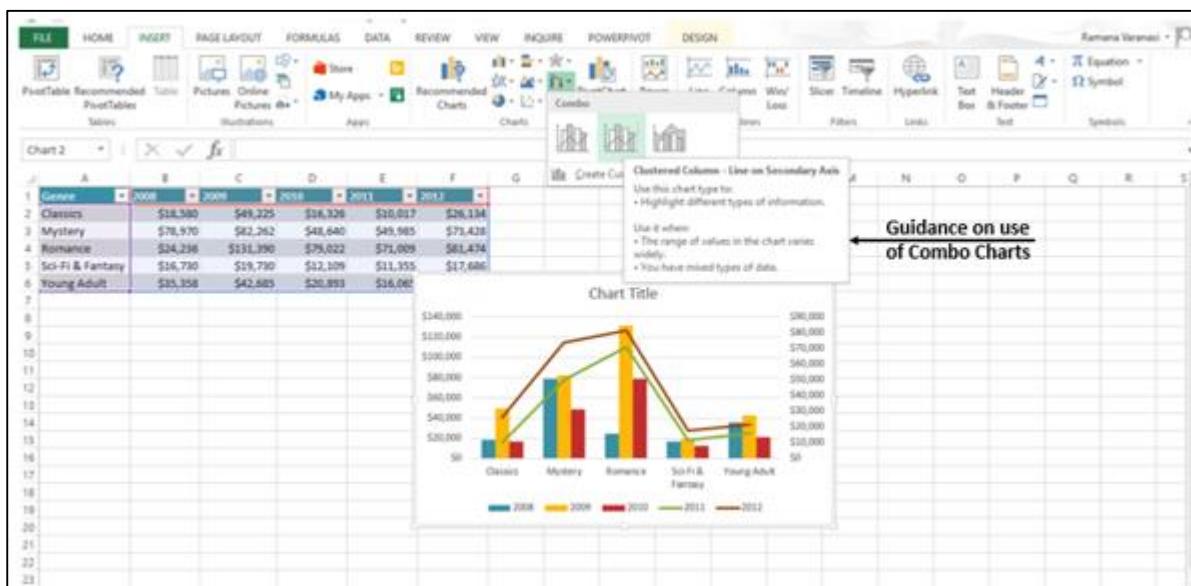
There is a new button for combo charts in Excel 2013.



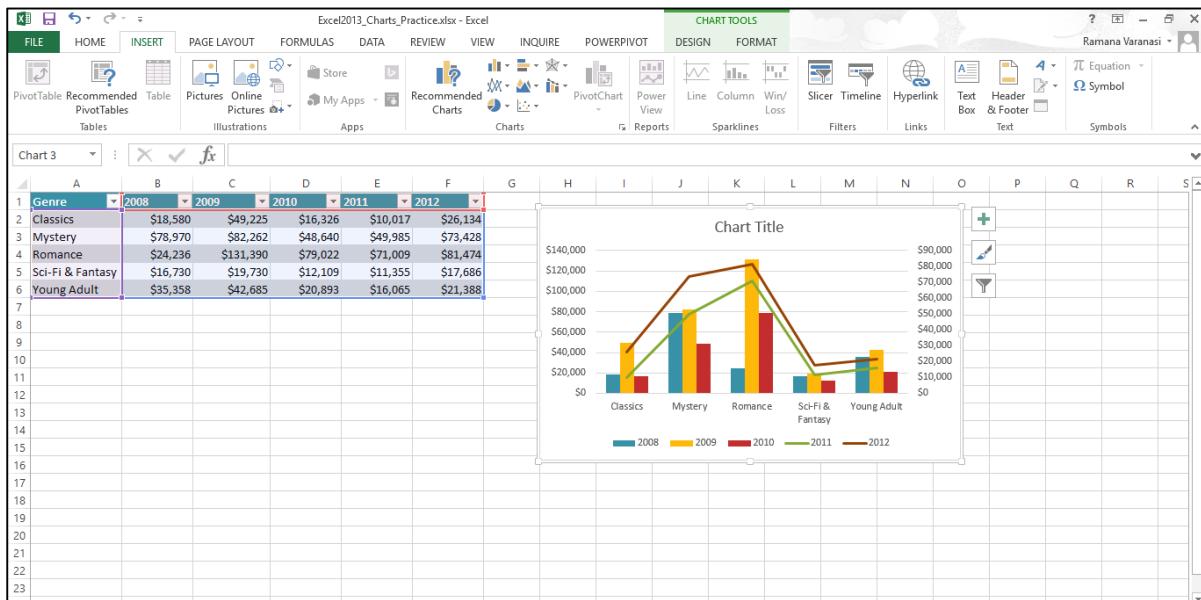
The following steps will show how to make a combo chart.

Step 1: Select the Data.

Step 2: Click on **Combo Charts**. As you scroll on the available Combo Charts, you will see the live preview of the chart. In addition, Excel displays guidance on the usage of that particular type of Combo Chart as shown in the image given below.



Step 3: Select a **Combo Chart** in the way you want the data to be displayed. The Combo Chart will be displayed.

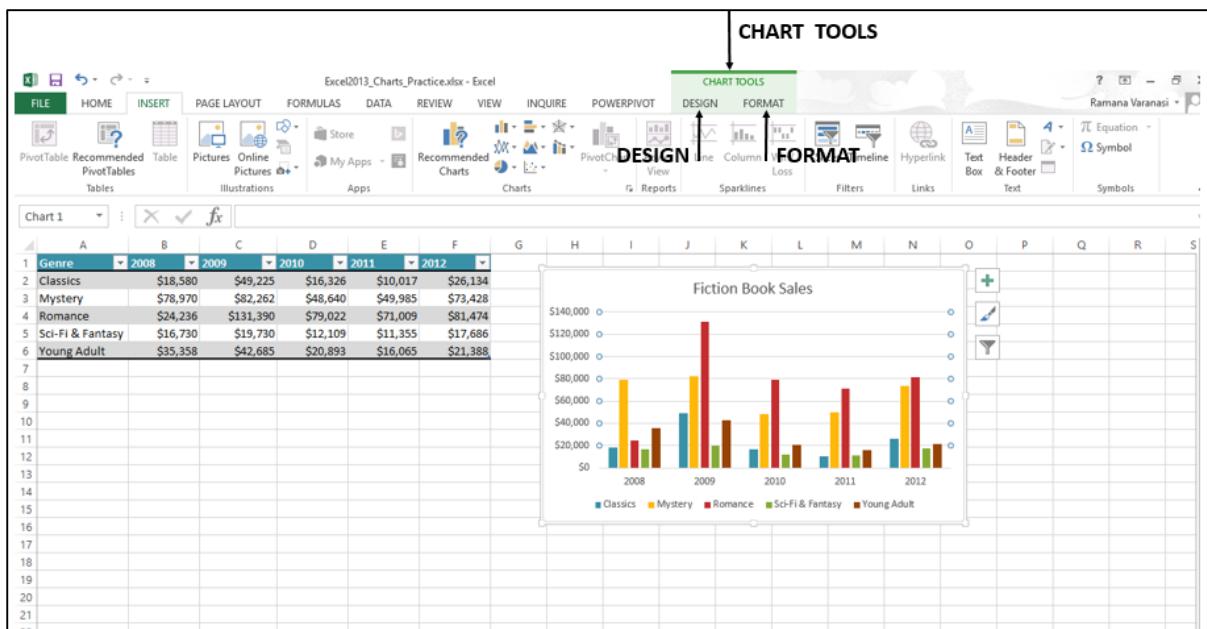


3. Excel – Chart Design

Ribbon of Chart Tools

When you click on your Chart, the **CHART TOOLS** tab, comprising of the **DESIGN** and **FORMAT** tabs is introduced on the ribbon.

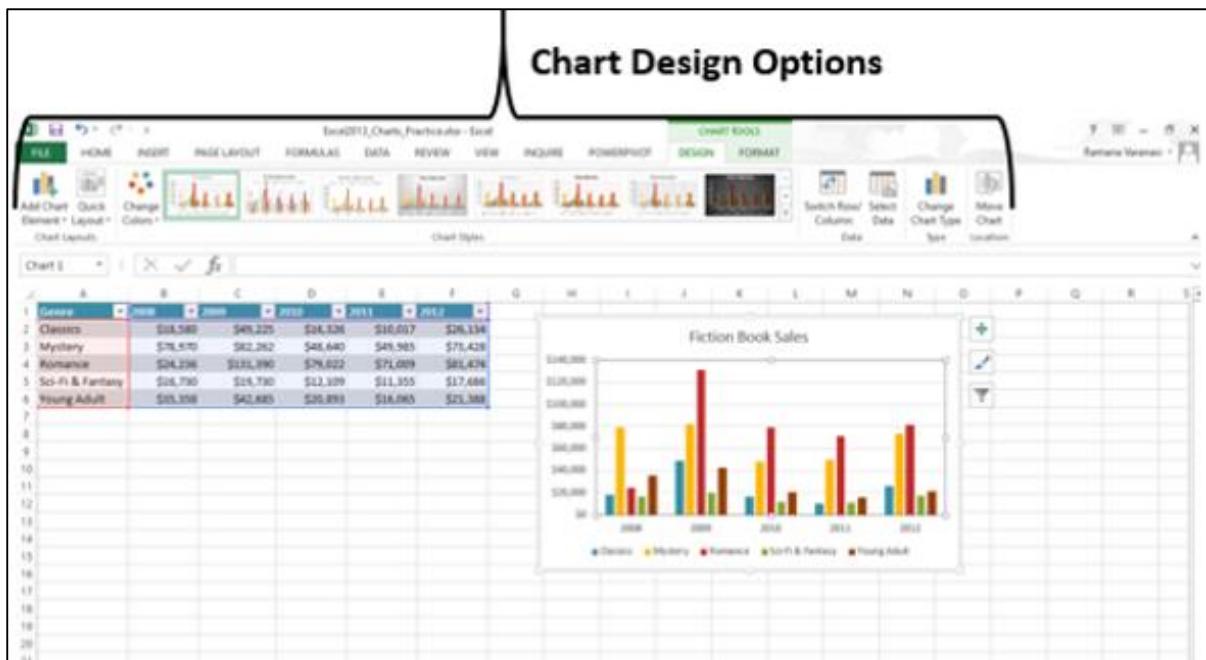
Step 1: Click on the Chart. **CHART TOOLS** with the **DESIGN** and **FORMAT** tabs will be displayed on the ribbon.



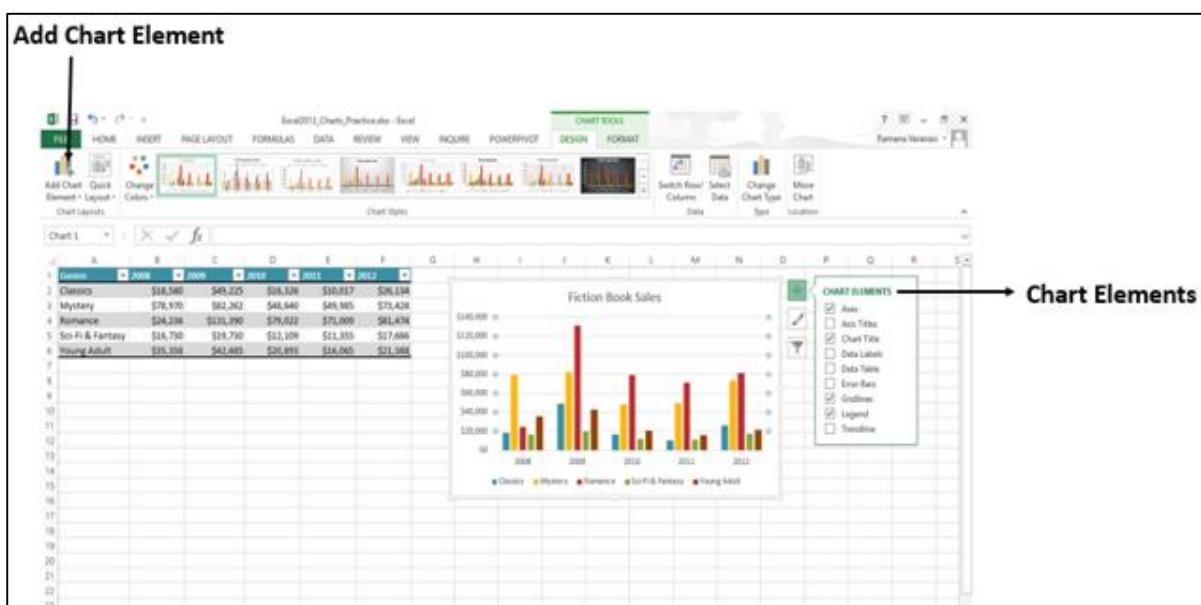
Let us understand the functions of the **DESIGN** tab.

Step 1: Click on the chart.

Step 2: Click on the **DESIGN** tab. The **Ribbon** now displays all the options of **Chart Design**.



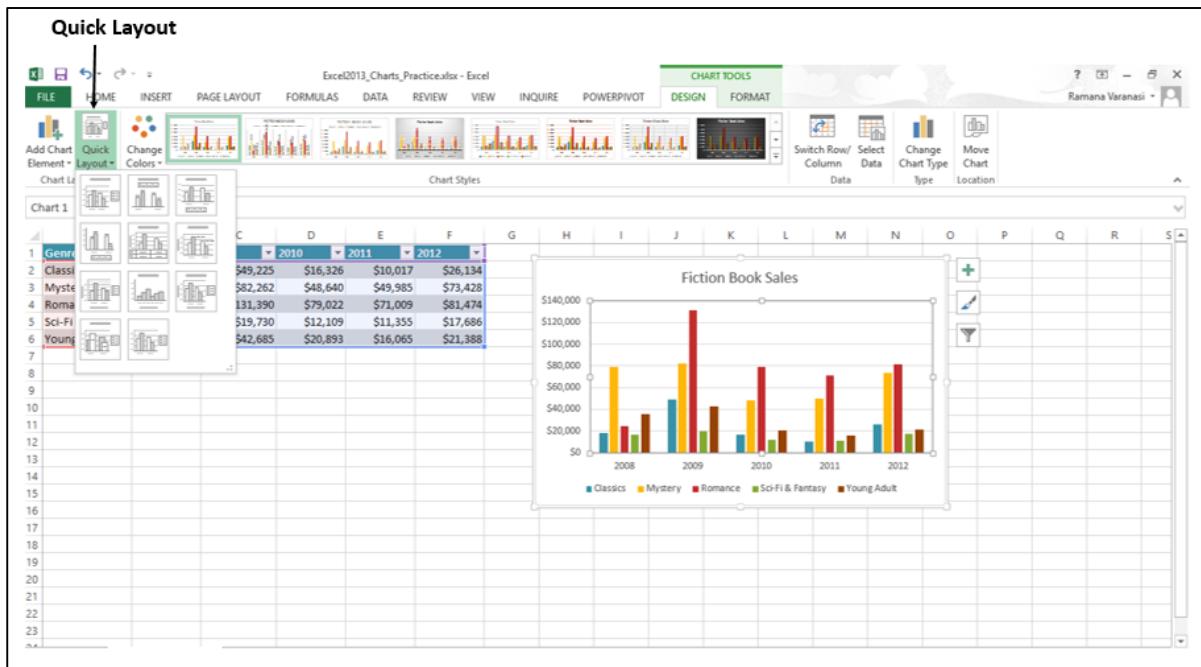
The first button on the ribbon is the **Add Chart Element**, which is the same as the **Chart Elements**, given at the upper right corner of the Charts as shown below.



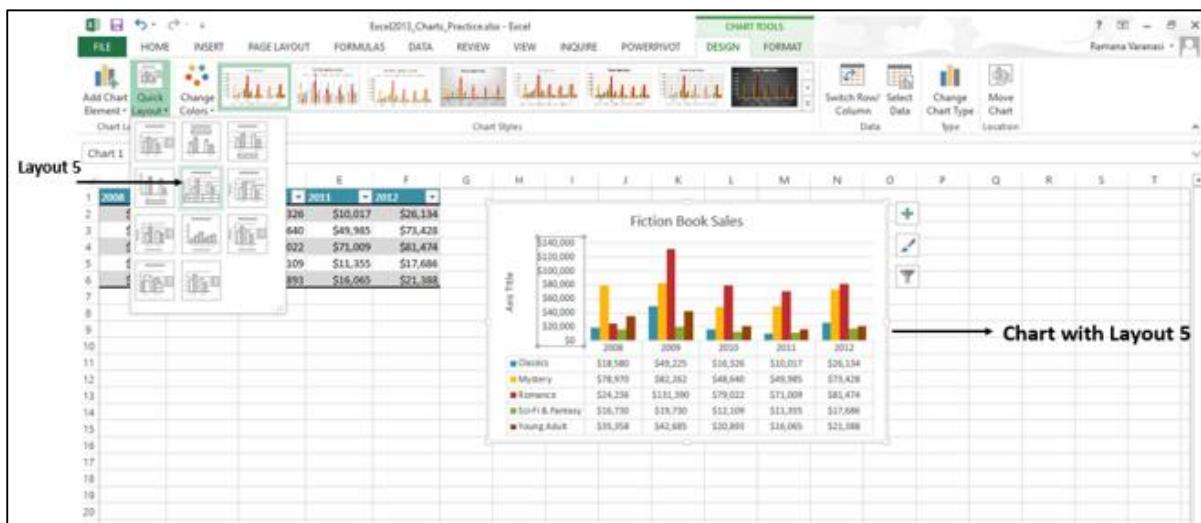
Quick Layout

You can use Quick Layout to change the overall layout of the Chart quickly by choosing one of the predefined layout options.

Step 1: Click on Quick Layout. Different possible layouts will be displayed.



Step 2: As you move on the layout options, the chart layout changes to that particular option. A preview of how your chart will look is shown.



Step 3: Click on the layout you like. The chart will be displayed with the chosen layout.

Change Colors

The **Change Colors** option is the same as in **CHART ELEMENTS -> Change Styles -> COLOR**.

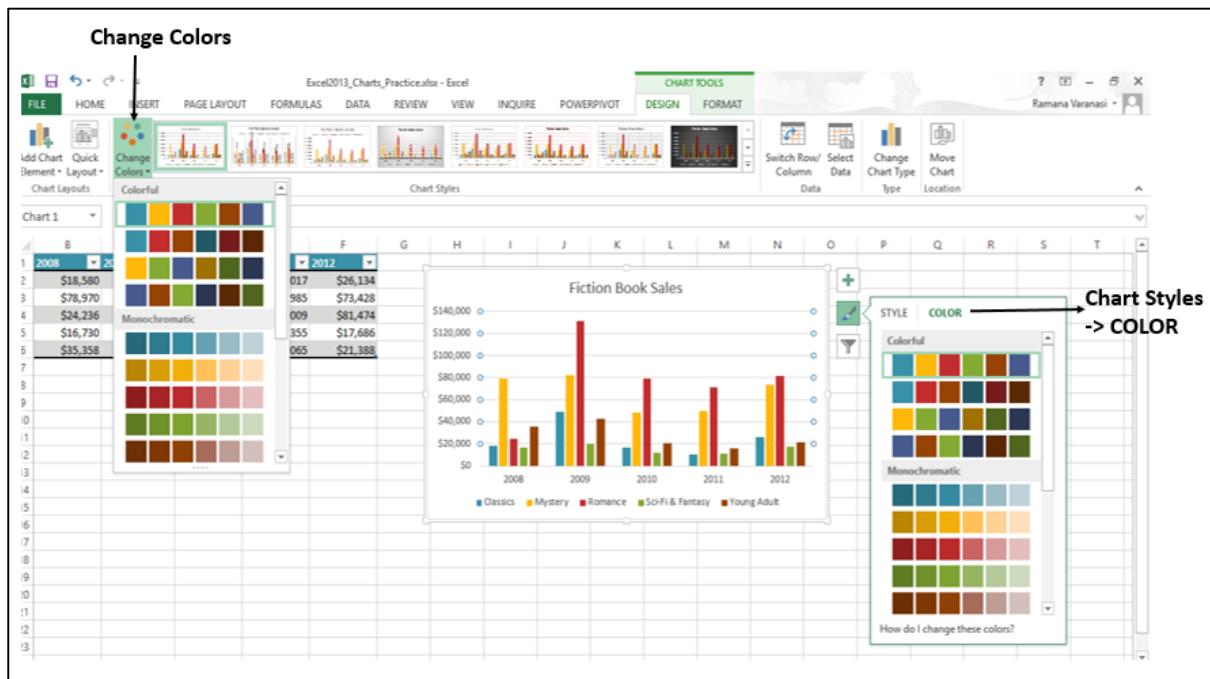
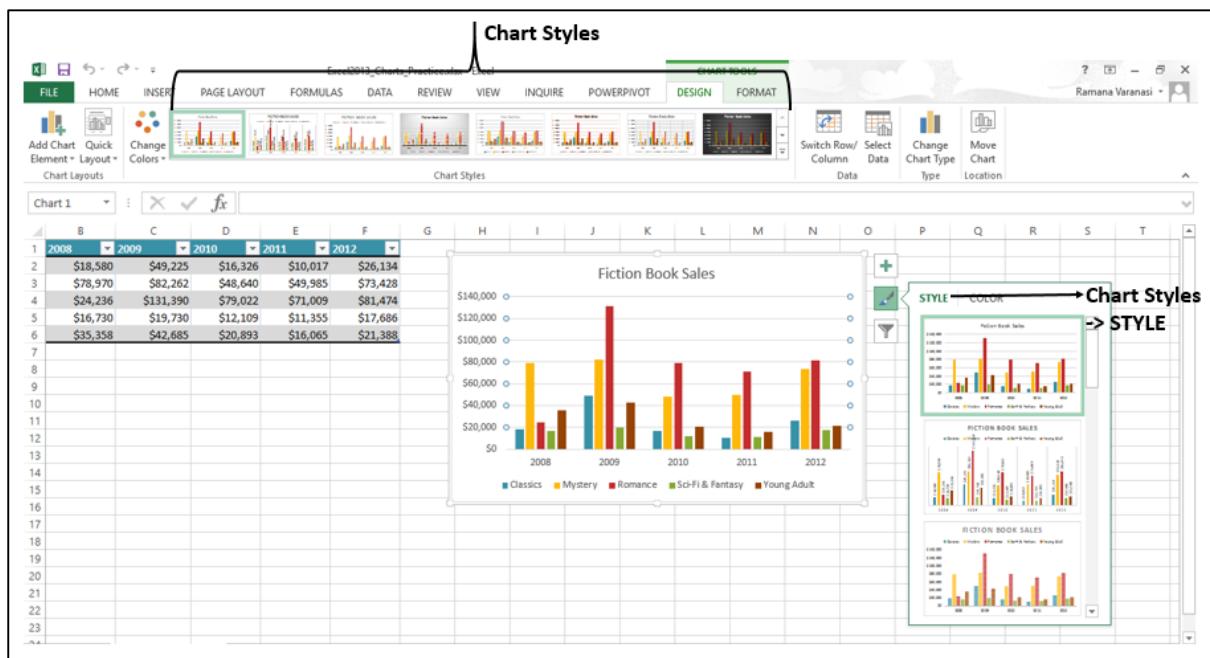


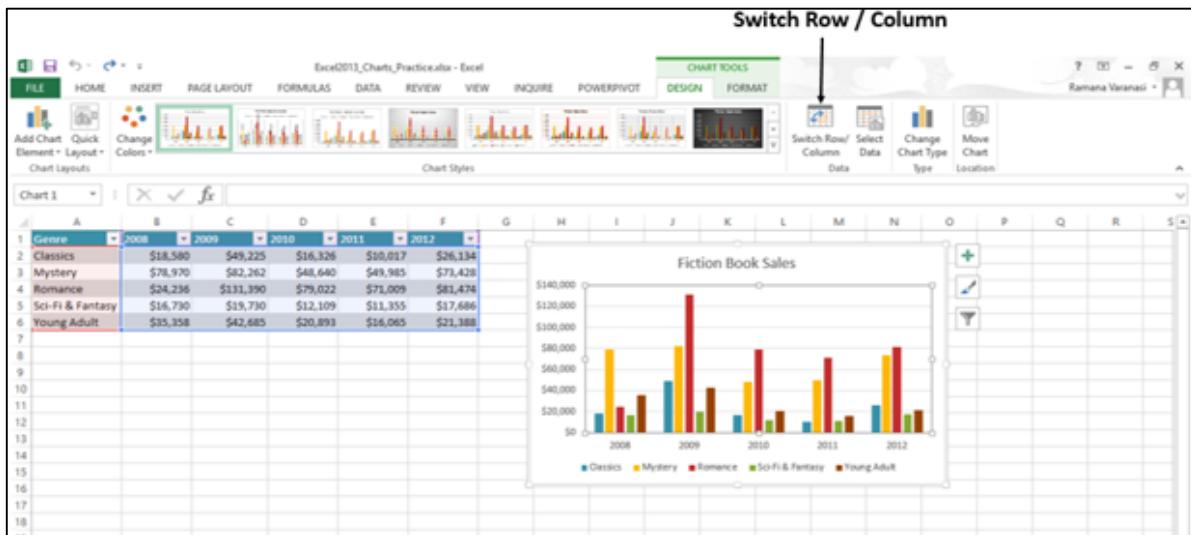
Chart Styles

The Chart Styles option is the same as in **CHART ELEMENTS -> Change Styles -> STYLE**.

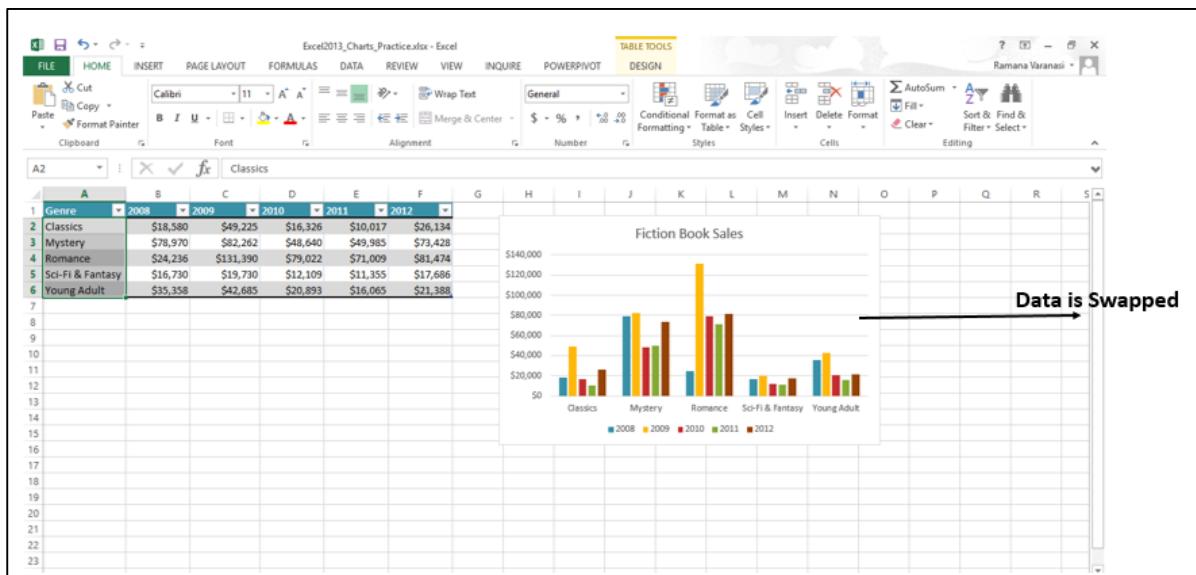


Switch Row / Column

You can use the **Switch Row / Column** button on the ribbon to change the display of data from X-axis to Y-axis and vice versa. Follow the steps given below to understand this.

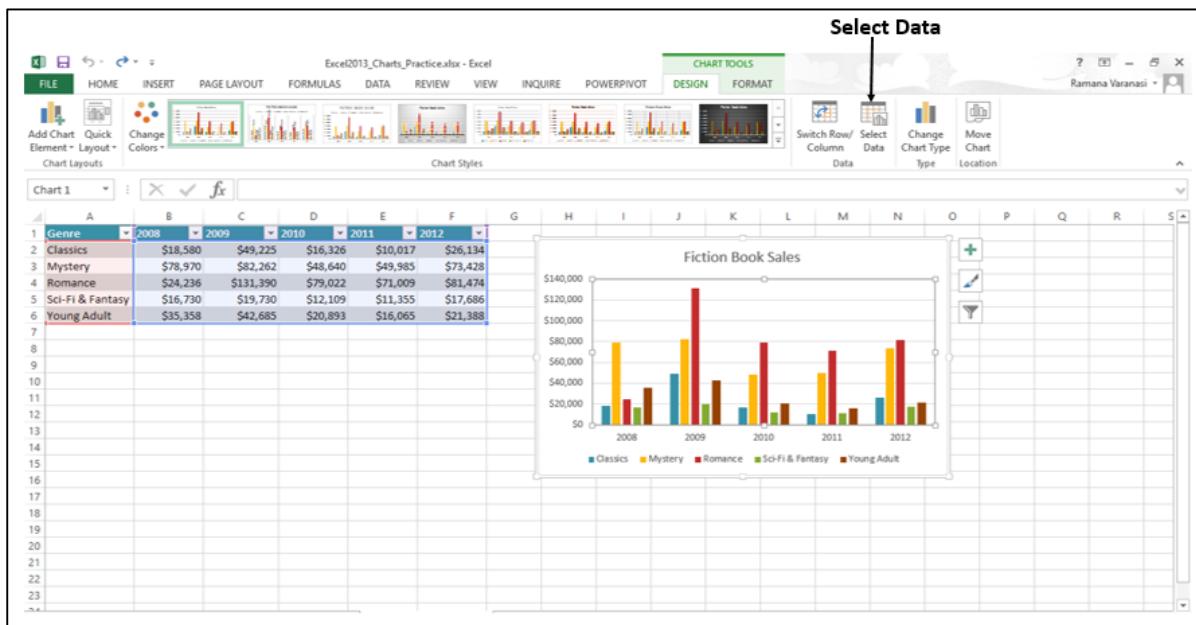


Step 1: Click on **Switch Row / Column**. You can see that the data will be swapped between X-Axis and Y-Axis.



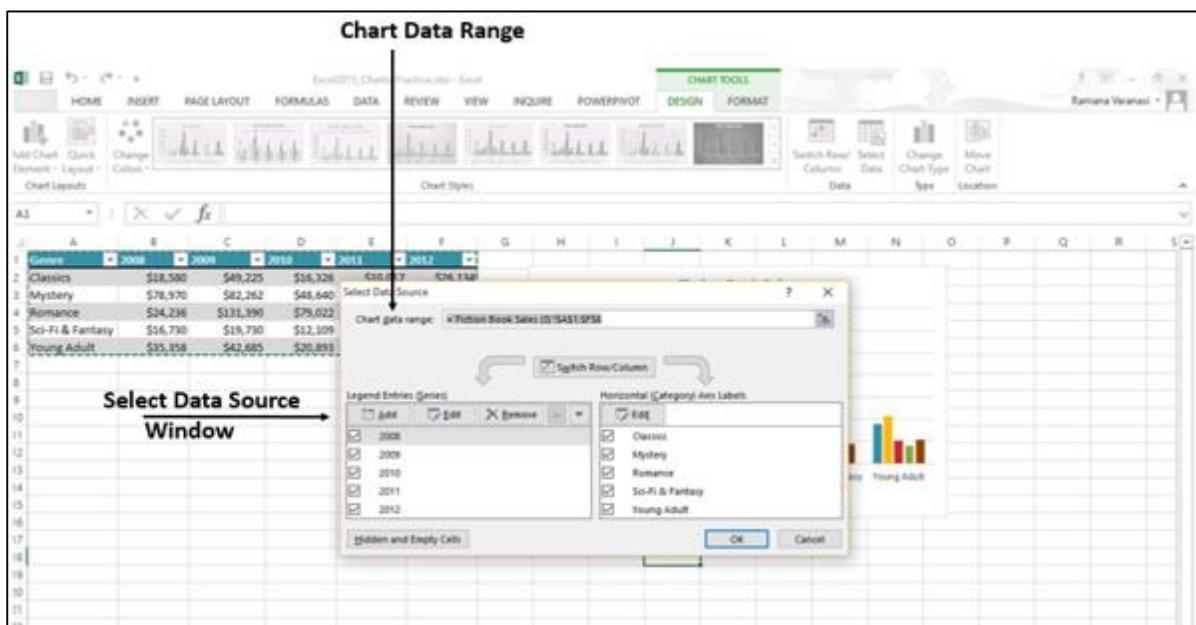
Select Data

You can change the Data Range included in the chart using this command.

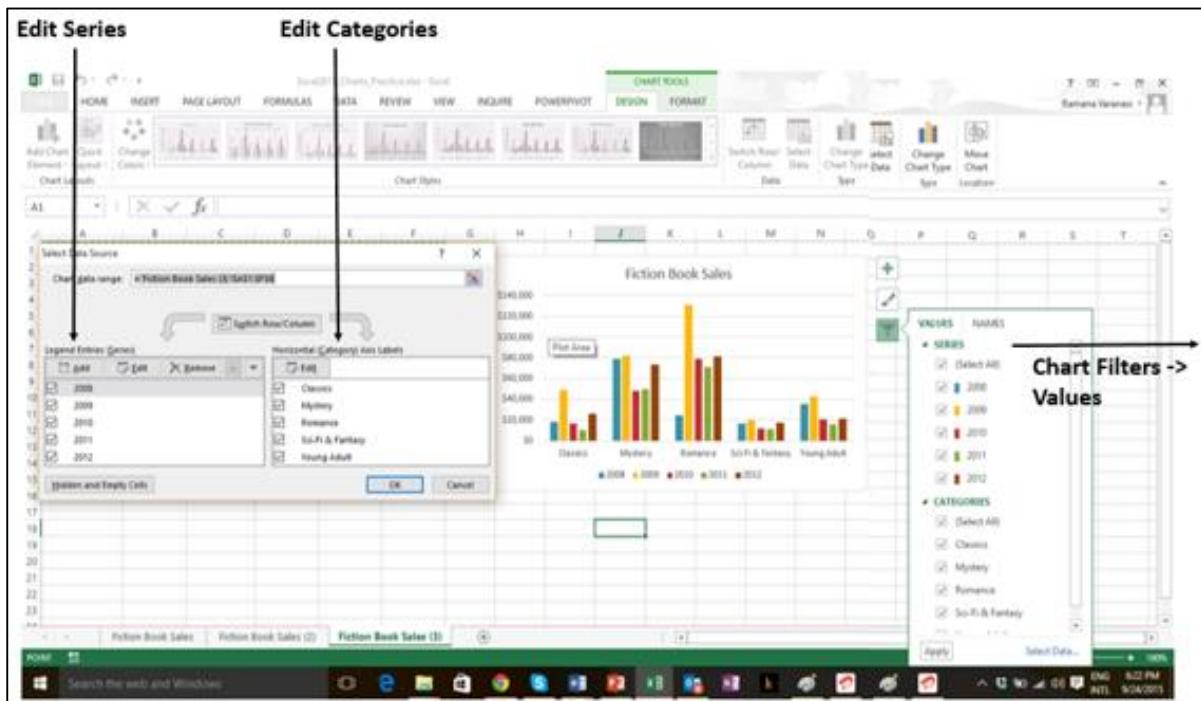


Step 1: Click on **Select Data**. The **Select Data Source** window appears as shown in the image given below.

Step 2: Select the **Chart Data Range**.

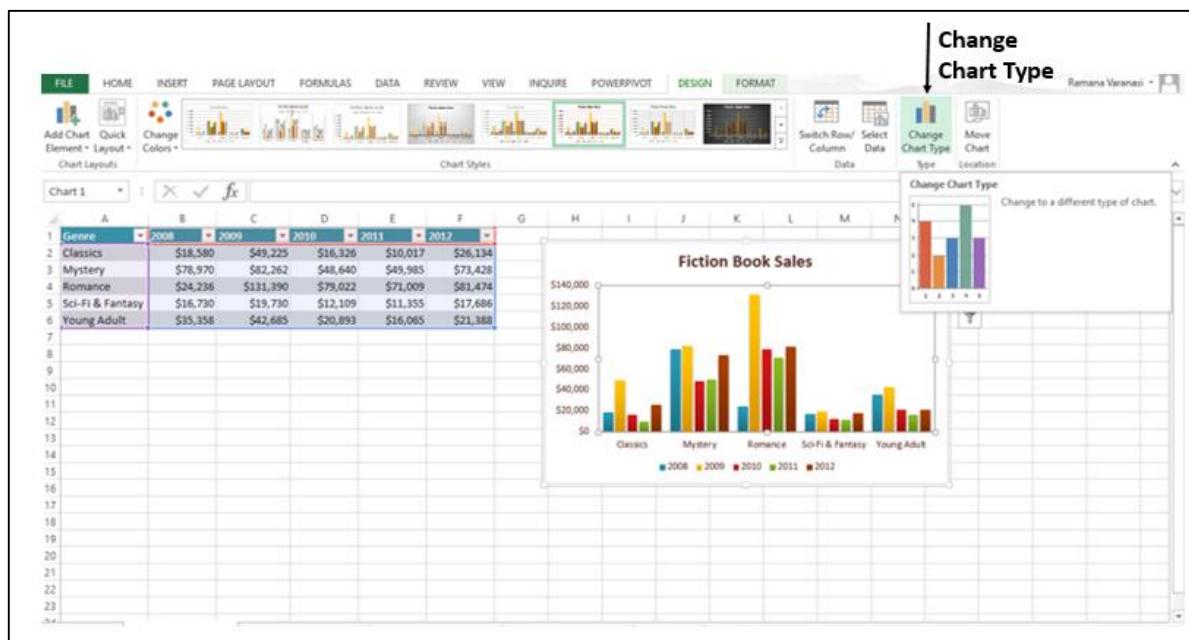


The window also has the options to edit the **Legend Entries (Series)** and **Categories**. This is the same as **Chart Elements -> Chart Filters -> VALUES**.

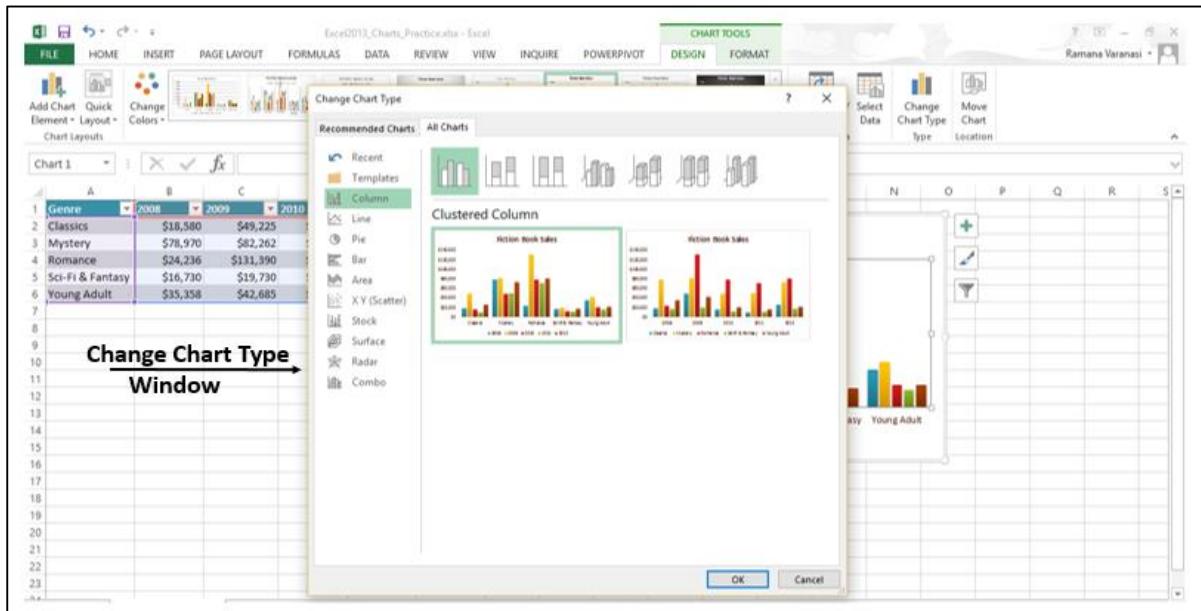


Change Chart Type

You can change to a different **Chart Type** using this option.



Step 1: Click on the **Change Chart Type** window. The **Change Chart Type** window appears.



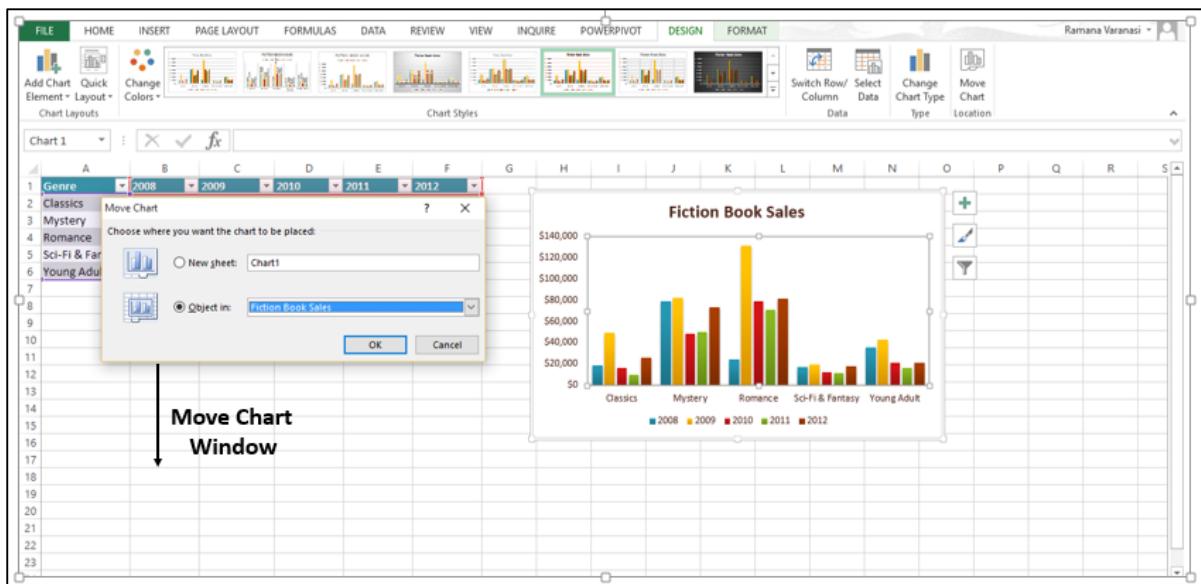
Step 2: Select the **Chart** Type you want. The Chart will be displayed with the type chosen.

Move Chart

You can move the Chart to another Worksheet in the Workbook using this option.



Click on **Move Chart**. The **Move Chart** window appears.



4. Excel – Richer Data Labels

You can have aesthetic and meaningful **Data Labels**. You can

- include rich and refreshable text from data points or any other text in your data labels
- enhance them with formatting and additional freeform text
- display them in just about any shape

Data labels stay in place, even when you switch to a different type of chart.

You can also connect them to their data points with **Leader Lines** on all charts and not just pie charts, which was the case in earlier versions of Excel.

Formatting Data Labels

We use a **Bubble Chart** to see the formatting of **Data Labels**.

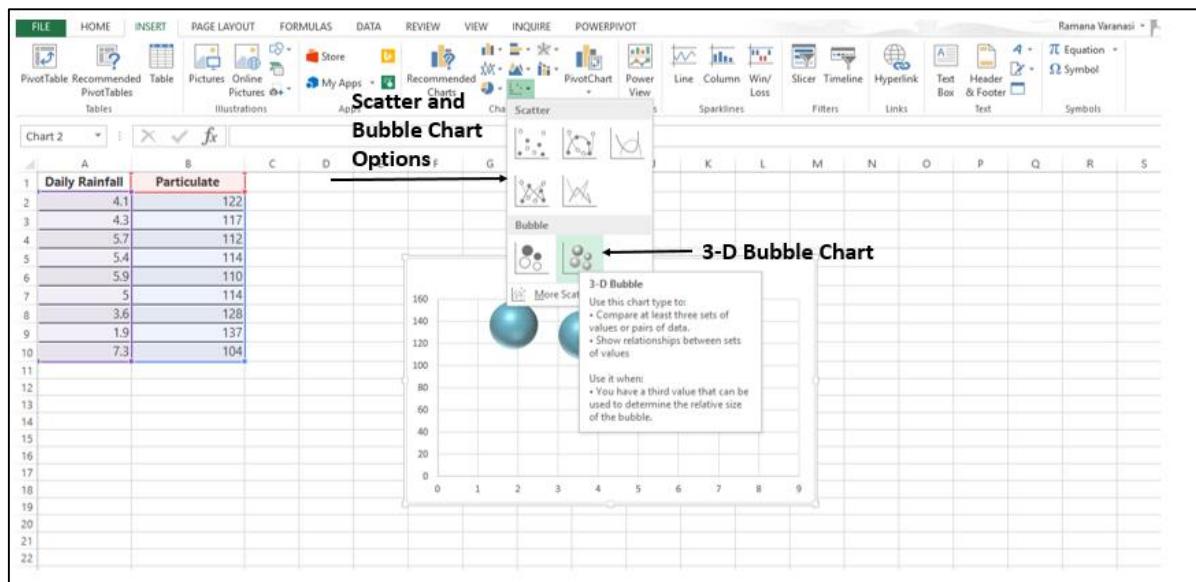
Step 1: Select your data.

Step 2: Click on the **Insert Scatter or the Bubble Chart**.

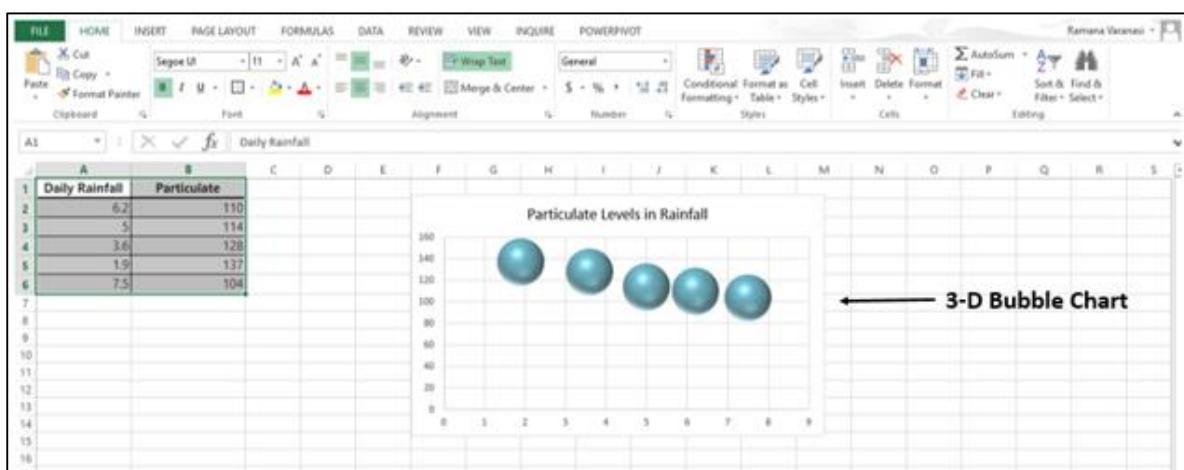
The screenshot shows a Microsoft Excel spreadsheet titled "Daily Rainfall". A table is present with columns for Daily Rainfall and Particulate. The "CHARTS" tab in the ribbon is selected, and a dropdown menu is open, showing various chart types. The "Bubble" icon is highlighted. A tooltip box appears over the "Bubble" icon, containing the text: "Insert Scatter (X, Y) or Bubble Chart. Use this chart type to show the relationship between sets of values. Click the arrow to see the different types of scatter and bubble charts available and pause the pointer on the icons to see a preview in your document." The background shows the rest of the Excel interface with other tabs like HOME, FORMULAS, REVIEW, and POWERPIVOT visible.

	A	B	C	D	E	F	G
1	Daily Rainfall	Particulate					
2	4.1	122					
3	4.3	117					
4	5.7	112					
5	5.4	114					
6	5.9	110					
7	5	114					
8	3.6	128					
9	1.9	137					
10	7.3	104					
11							
12							
13							
14							
15							
16							
17							

The options for the Scatter Charts and the 2-D and 3-D Bubble Charts appear.



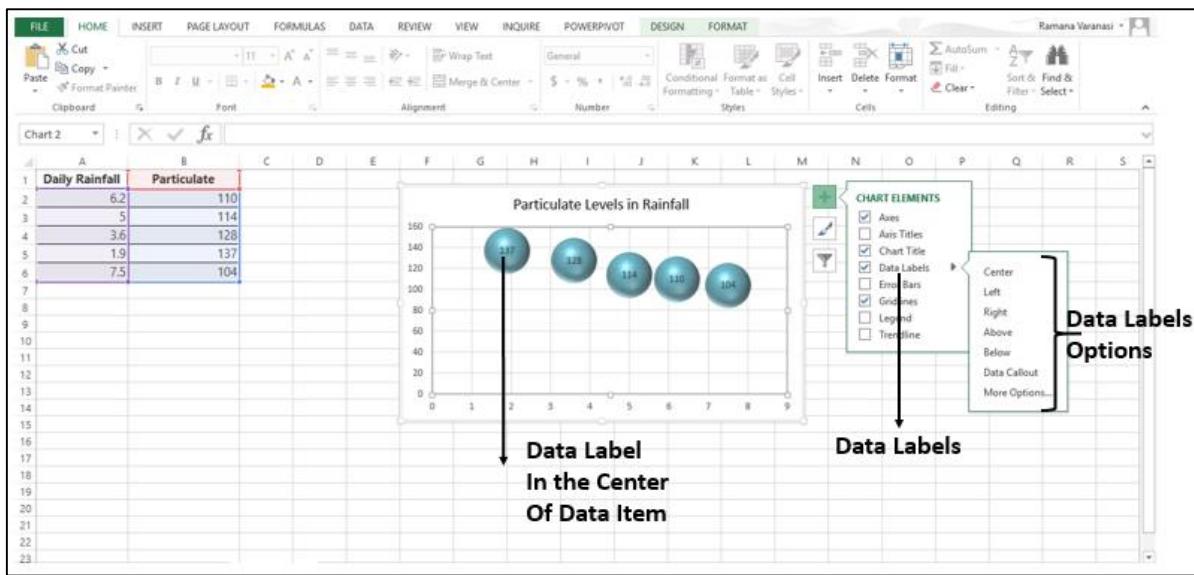
Step 3: Click on the **3-D Bubble Chart**. The **3-D Bubble Chart** will appear as shown in the image given below.



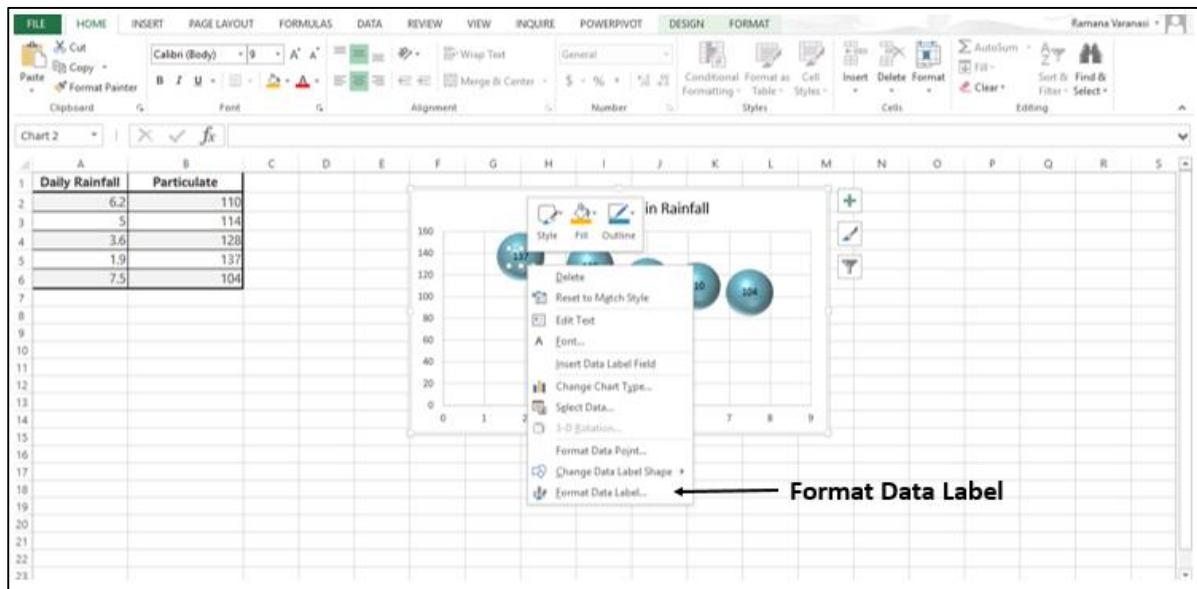
Step 4: Click on the chart and then click on **Chart Elements**.

Step 5: Select **Data Labels** from the options. Select the small symbol given on the right of **Data Labels**. Different options for the placement of the **Data Labels** appear.

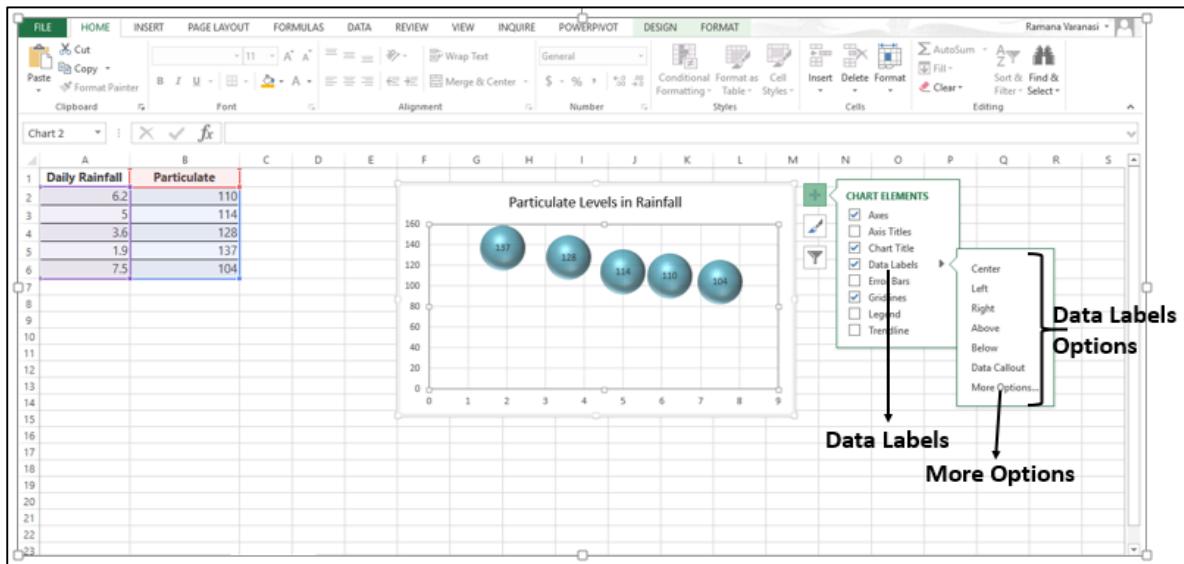
Step 6: If you select **Center**, the **Data Labels** will be placed at the center of the Bubbles.



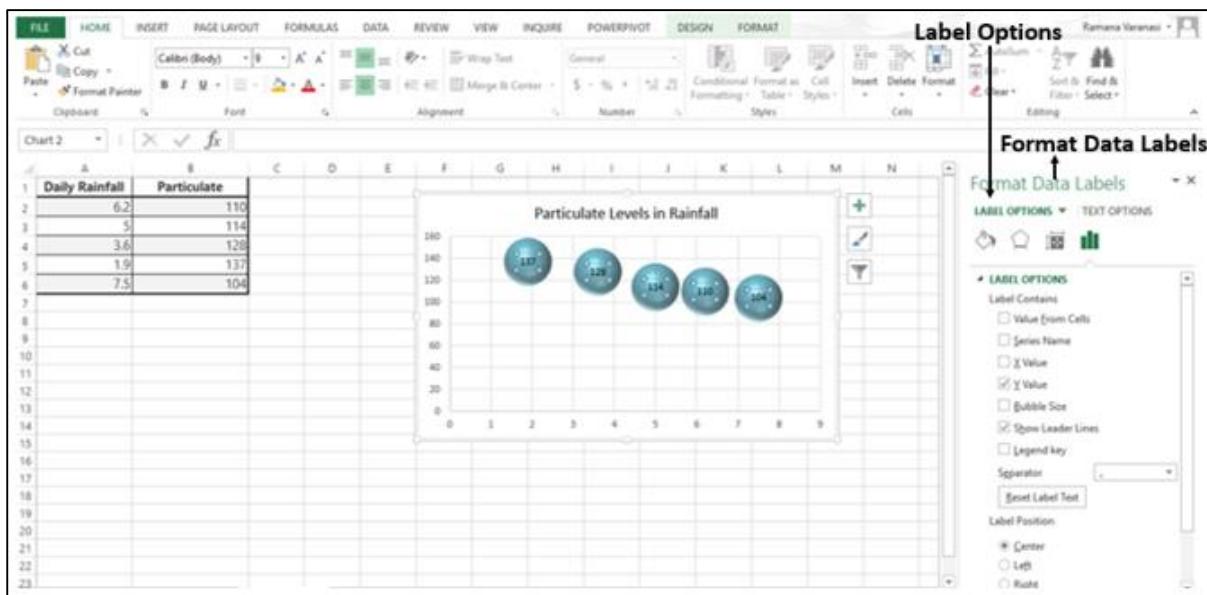
Step 7: Right-click on any one **Data Label**. A list of option appears as shown in the image given below.



Step 8: Click on the **Format Data Label**. Alternatively, you can also click on **More Options** available in the **Data Labels** options to display the **Format Data Label** Task Pane.

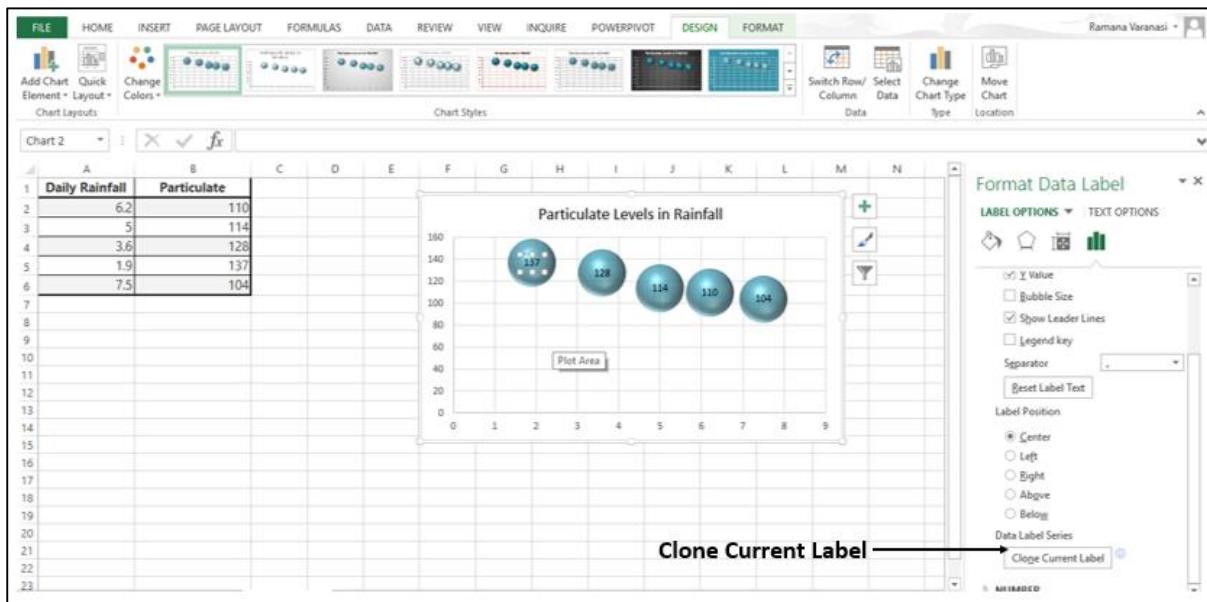


The **Format Data Label** Task Pane appears.



There are many options available for formatting of the **Data Labels** in the **Format Data Labels** Task Pane. Make sure that only one **Data Label** is selected while formatting.

Step 9: In **Label Options → Data Label Series**, click on **Clone Current Label**.



This will enable you to apply your custom **Data Label** formatting quickly to the other data points in the series.

Look of the Data Labels

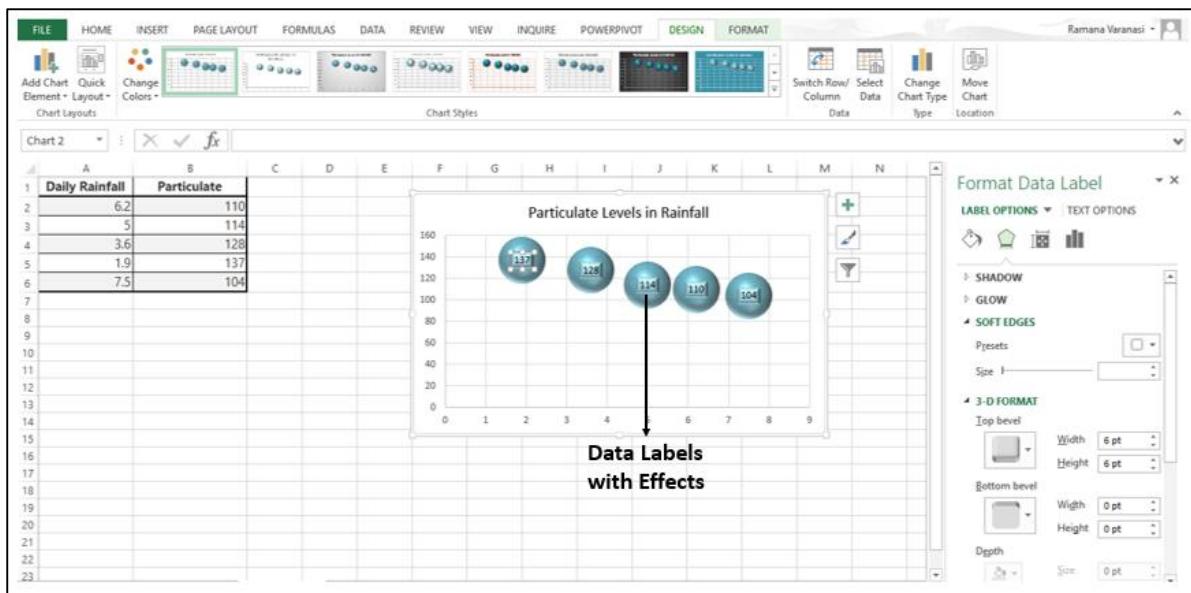
You can do many things to change the look of the **Data Label**, like changing the Fill color of the **Data Label** for emphasis.

Step 1: Click on the **Data Label**, whose Fill color you want to change. Double click to change the **Fill color** for just one **Data Label**. The **Format Data Label** Task Pane appears.

Step 3: Click **Fill → Solid Fill**. Choose the Color you want and then make the changes.

Step 4: Click **Effects** and choose the required effects. For example, you can make the label pop by adding an effect. Just be careful not to go overboard adding effects.

Step 5: In the **Label Options → Data Label Series**, click on **Clone Current Label**. All the other data labels will acquire the same effect.

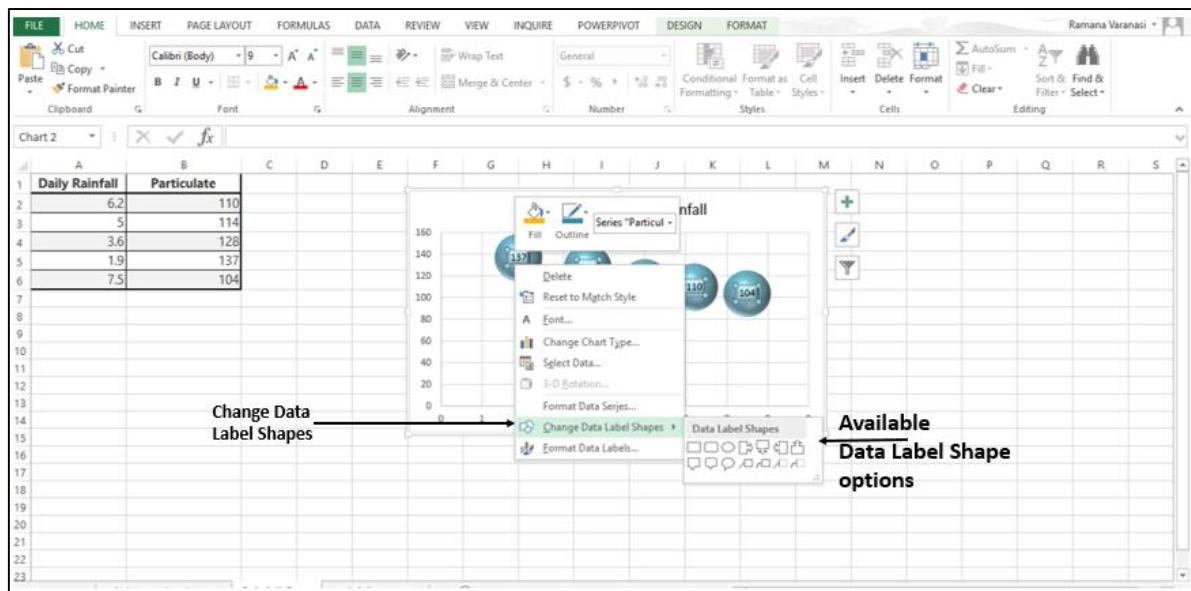


Shape of a Data Label

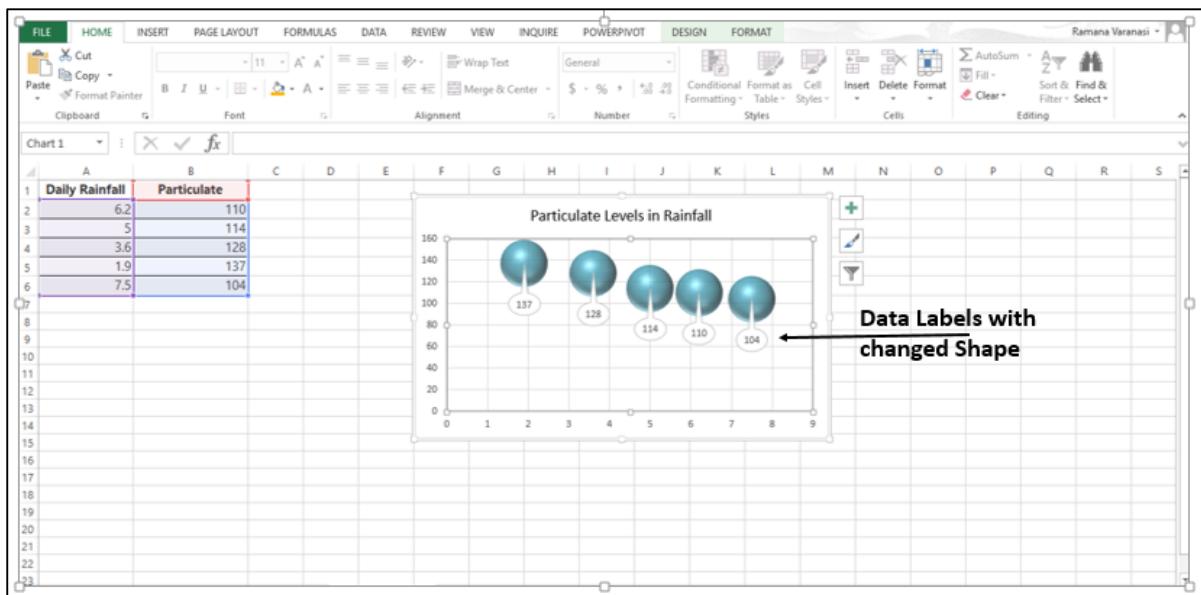
You can personalize your chart by changing the shapes of the **Data Label**.

Step 1: Right-click the **Data Label** you want to change.

Step 2: Click on **Change Data Label Shapes**.



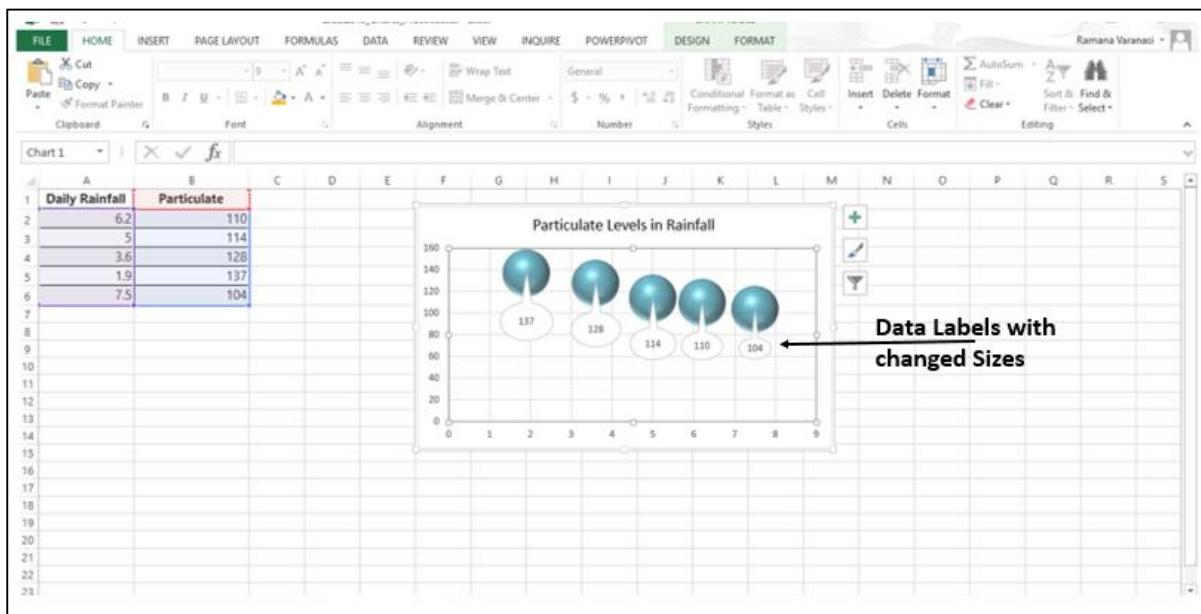
Step 3: Choose the shape you want.



Resize a Data Label

Step 1: Click on the data label.

Step 2: Drag it to the size you want. Alternatively, you can click on **Size & Properties** icon in the **Format Data Labels** task pane and then choose the size options.

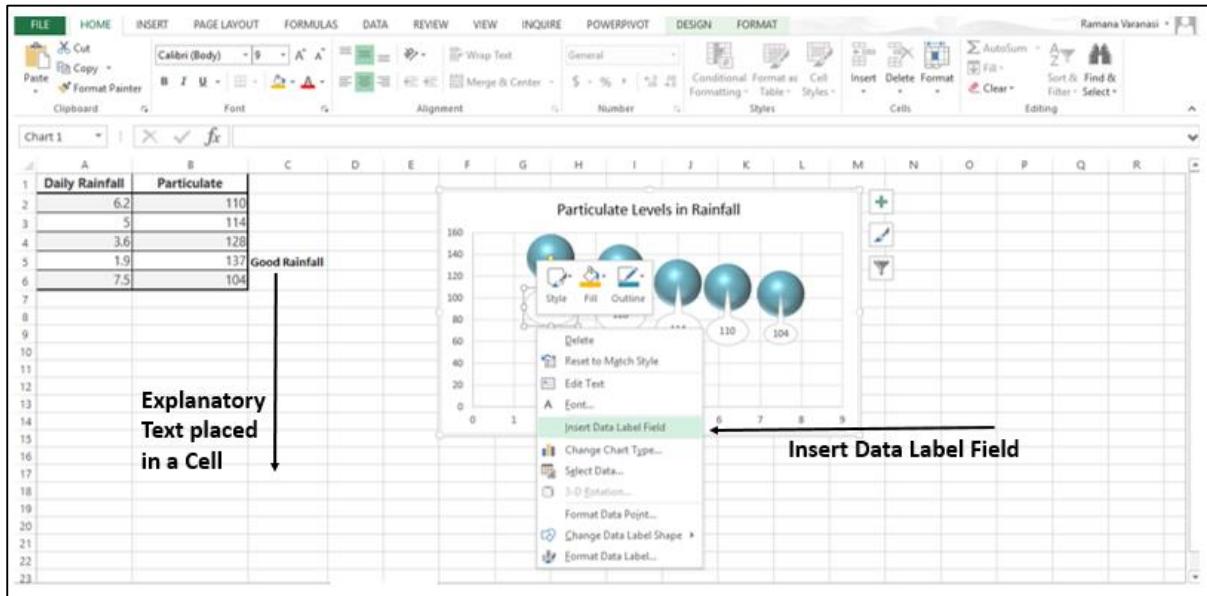


Add a Field to a Data Label

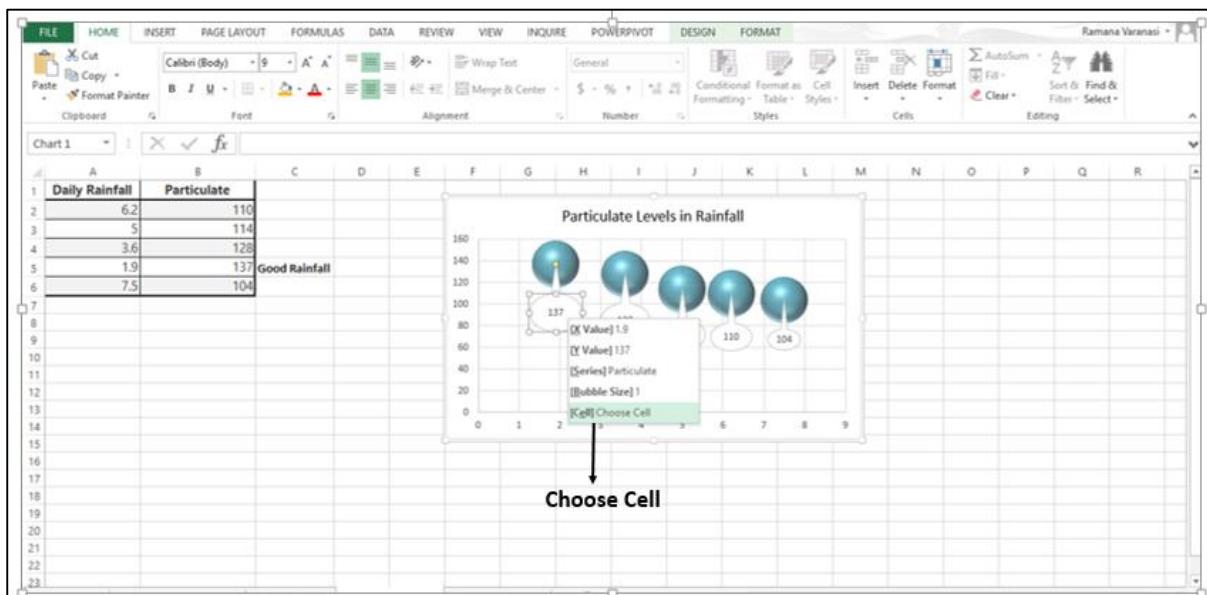
Excel 2013 has a powerful feature of adding a cell reference with explanatory text or a calculated value to a data label. Let us see how to add a field to the data label.

Step 1: Place the **Explanatory text** in a cell.

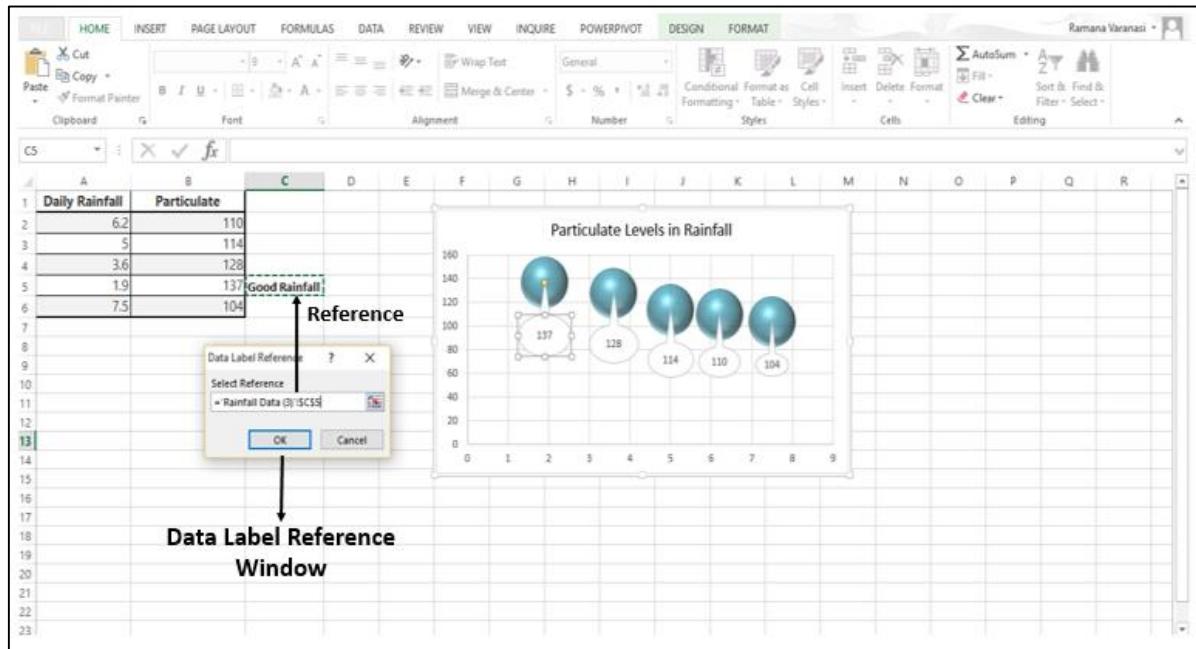
Step 2: Right-click on a data label. A list of options will appear.



Step 3: Click on the option-**Insert Data Label Field**.

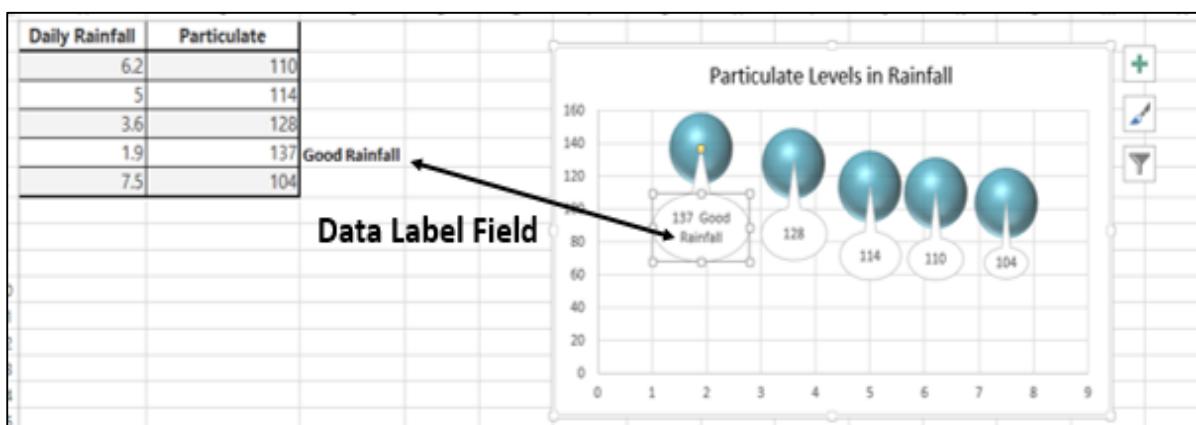


Step 4: From the available options, Click on **Choose Cell**. A **Data Label Reference** window appears.



Step 5: Select the **Cell Reference** where the Explanatory Text is written and then click **OK**. The explanatory text appears in the data label.

Step 6: Resize the data label to view the entire text.



5. Excel – Leader Lines

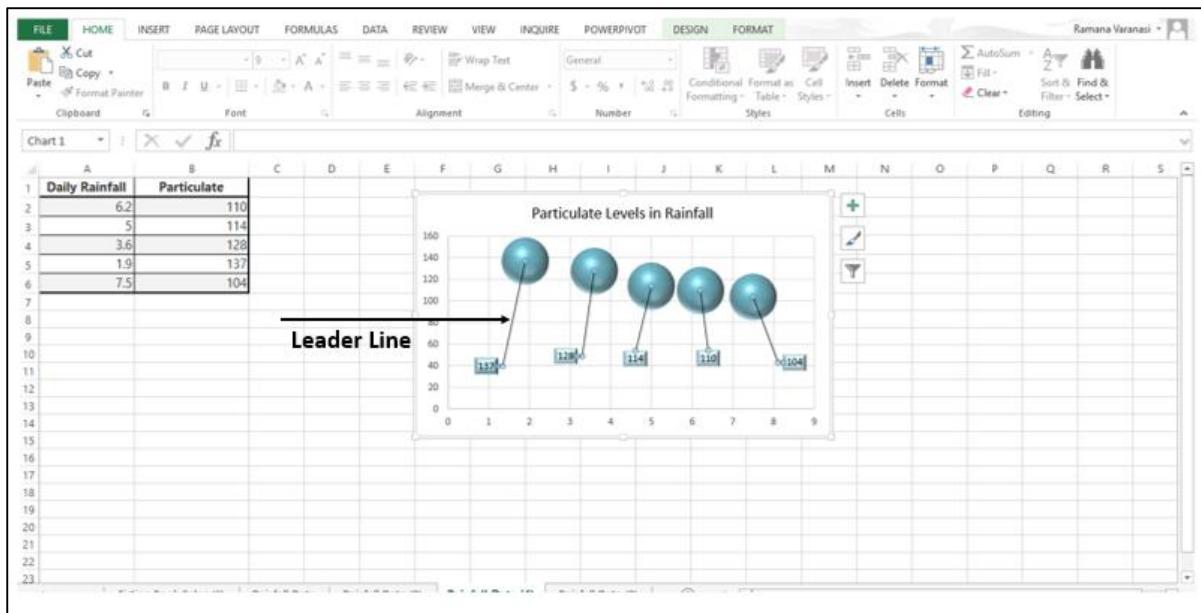
A **Leader Line** is a line that connects a data label and its associated data point. It is helpful when you have placed a data label away from a data point.

In earlier versions of Excel, only the pie charts had this functionality. Now, all the chart types with data label have this feature.

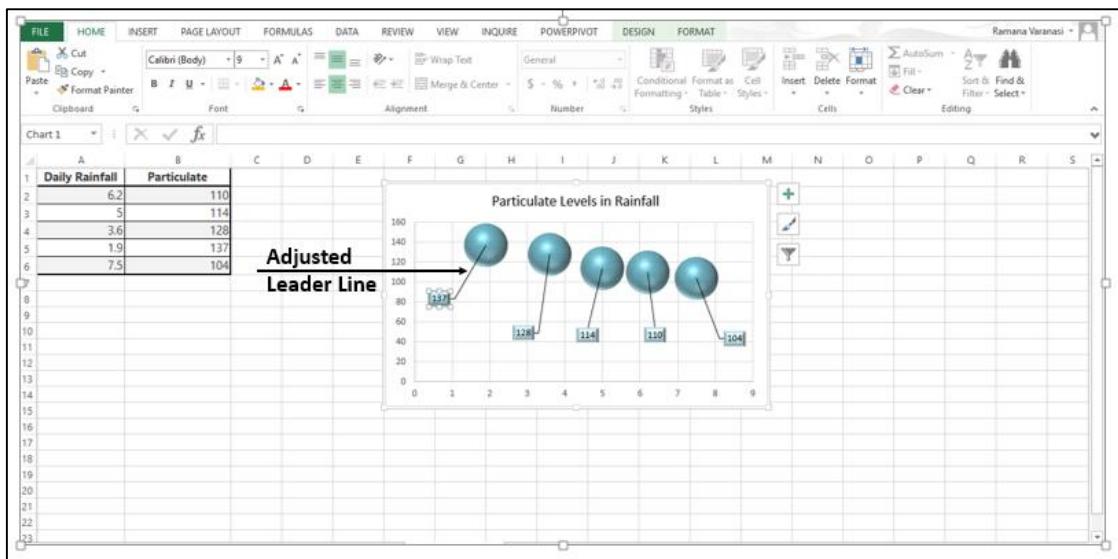
Add a Leader Line

Step 1: Click on the data label.

Step 2: Drag it after you see the four-headed arrow.

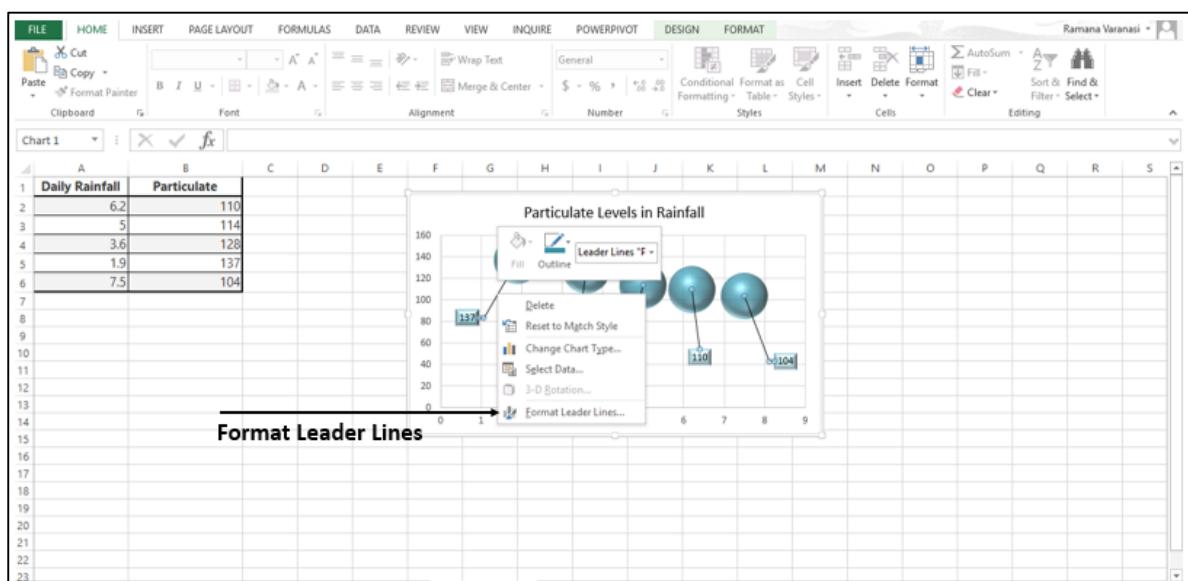


Step 3: Move the data label. The **Leader Line** automatically adjusts and follows it.

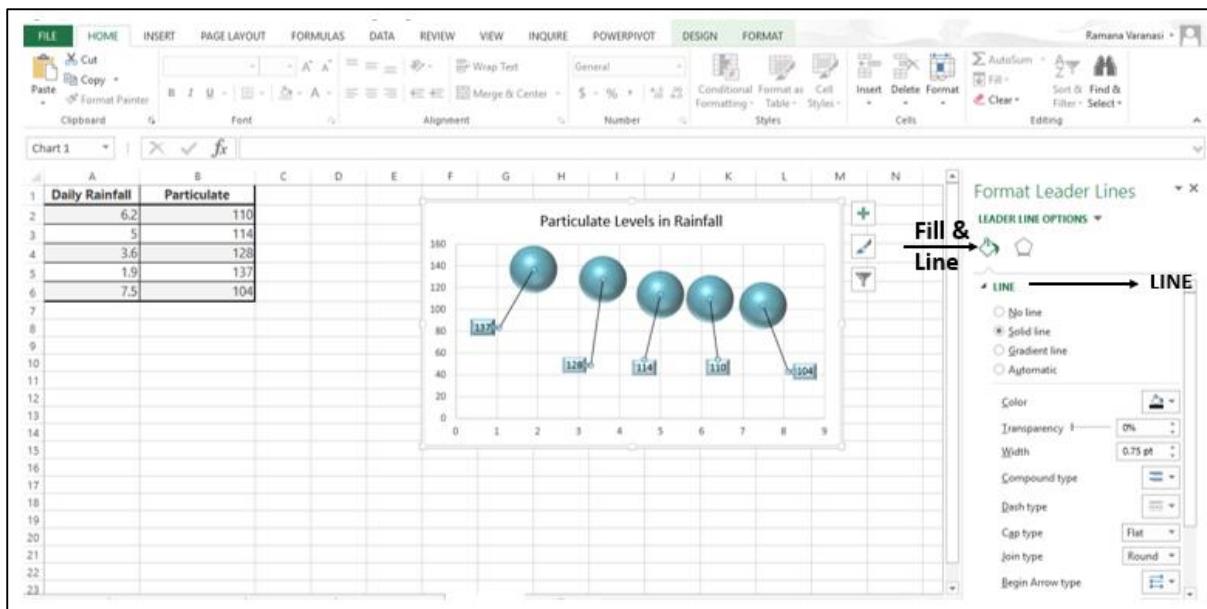


Format Leader Lines

Step 1: Right-click on the **Leader Line** you want to format.



Step 2: Click on **Format Leader Lines**. The **Format Leader Lines** task pane appears. Now you can format the leader lines as you require.



Step 3: Click on the icon **Fill & Line**.

Step 4: Click on **LINE**.

Step 5: Make the changes that you want. The leader lines will be formatted as per your choices.

6. Excel – New Functions

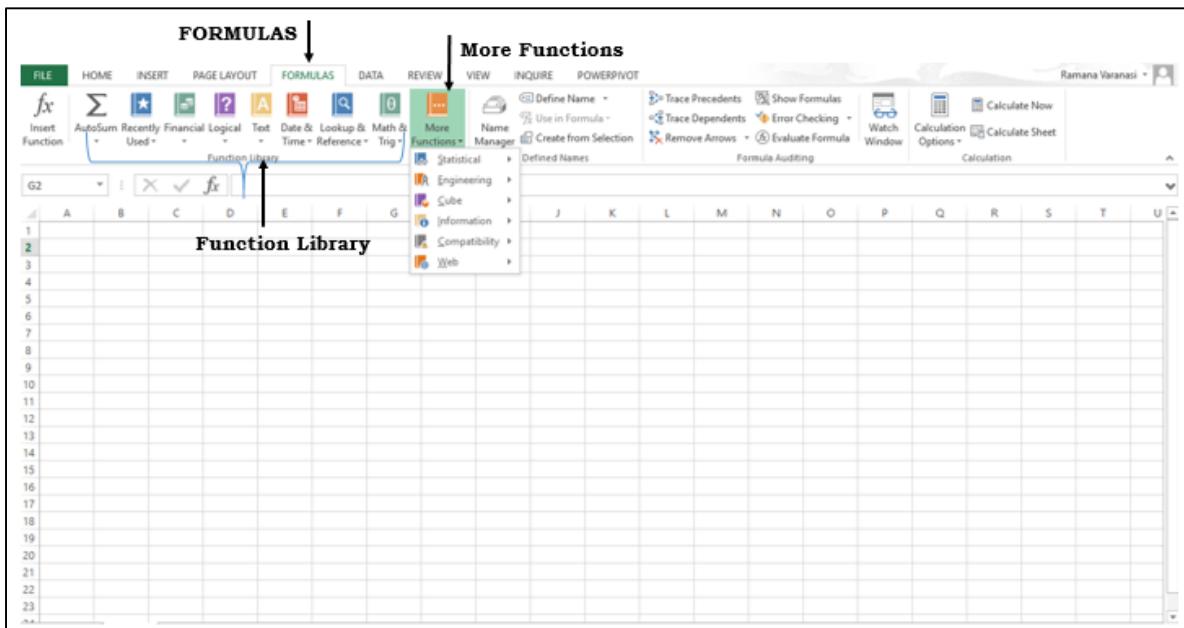
Several new functions are added in the math and trigonometry, statistical, engineering, date and time, lookup and reference, logical, and text function categories. Also, Web category is introduced with few Web service functions.

Functions by Category

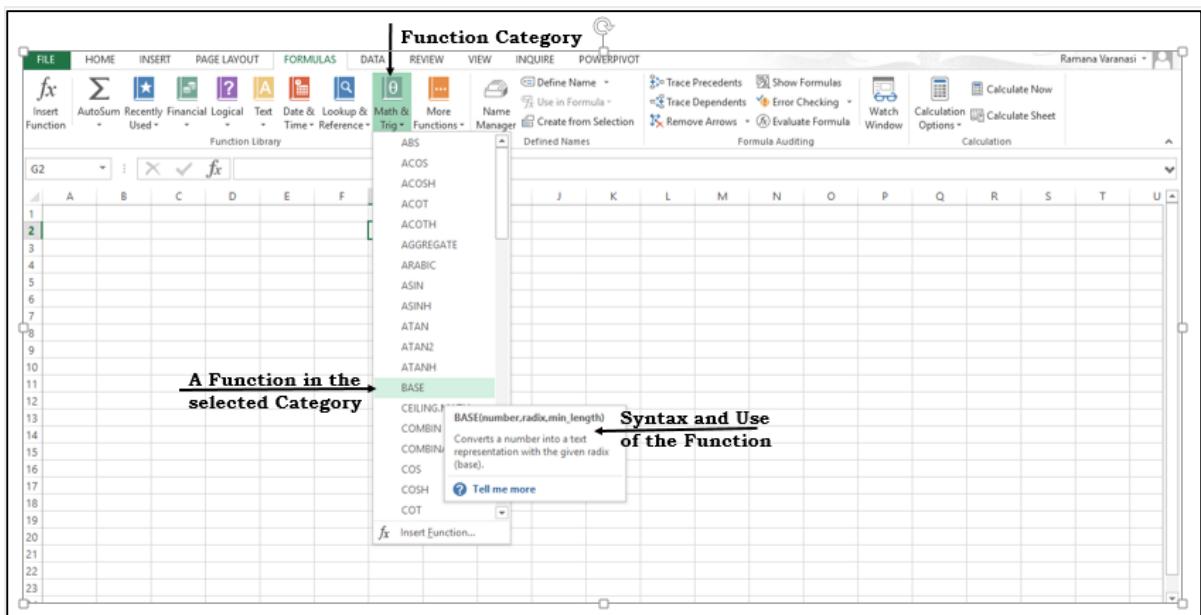
Excel functions are categorized by their functionality. If you know the category of the function that you are looking for, you can click that category.

Step 1: Click on the **FORMULAS** tab. The **Function Library** group appears. The group contains the function categories.

Step 2: Click on **More Functions**. Some more function categories will be displayed.



Step 3: Click on a function category. All the functions in that category will be displayed. As you scroll on the functions, the syntax of the function and the use of the function will be displayed as shown in the image given below.



New Functions in Excel 2013

Date and Time Functions

- DAY**: Returns the number of days between two dates.
- ISOWEEKNUM**: Returns the number of the ISO week number of the year for a given date.

Engineering Functions

- BITAND**: Returns a 'Bitwise And' of two numbers.
- BITLSHIFT**: Returns a value number shifted left by shift_amount bits.
- BITOR**: Returns a bitwise OR of 2 numbers.
- BITRSHIFT**: Returns a value number shifted right by shift_amount bits.
- BITXOR**: Returns a bitwise 'Exclusive Or' of two numbers.
- IMCOSH**: Returns the hyperbolic cosine of a complex number.
- IMCOT**: Returns the cotangent of a complex number.
- IMCSC**: Returns the cosecant of a complex number.
- IMCSCH**: Returns the hyperbolic cosecant of a complex number.
- IMSEC**: Returns the secant of a complex number.

- **IMSECH** : Returns the hyperbolic secant of a complex number.
- **IMSIN**: Returns the sine of a complex number.
- **IMSINH**: Returns the hyperbolic sine of a complex number.
- **IMTAN**: Returns the tangent of a complex number.

Financial Functions

- **PDURATION**: Returns the number of periods required by an investment to reach a specified value.
- **RRI**: Returns an equivalent interest rate for the growth of an investment.

Information Functions

- **ISFORMULA**: Returns TRUE if there is a reference to a cell that contains a formula.
- **SHEET**: Returns the sheet number of the referenced sheet.
- **SHEETS**: Returns the number of sheets in a reference.

Logical Functions

- **IFNA**: Returns the value you specify if the expression resolves to #N/A, otherwise returns the result of the expression.
- **XOR**: Returns a logical exclusive OR of all arguments.

Lookup and Reference Functions

- **FORMULATEXT**: Returns the formula at the given reference as text.
- **GETPIVOTDATA**: Returns data stored in a PivotTable report.

Math and Trigonometry Functions

- **ACOT**: Returns the arccotangent of a number.
- **ACOTH**: Returns the hyperbolic arccotangent of a number.
- **BASE**: Converts a number into a text representation with the given radix (base).
- **CEILING.MATH**: Rounds a number up, to the nearest integer or to the nearest multiple of significance.
- **COMBINA**: Returns the number of combinations with repetitions for a given number of items.
- **COT**: Returns the cotangent of an angle.
- **COTH**: Returns the hyperbolic cotangent of a number.

- **CSC:** Returns the cosecant of an angle.
- **CSCH:** Returns the hyperbolic cosecant of an angle.
- **DECIMAL:** Converts a text representation of a number in a given base into a decimal number.
- **FLOOR.MATH:** Rounds a number down, to the nearest integer or to the nearest multiple of significance.
- **ISO.CEILING:** Returns a number that is rounded up to the nearest integer or to the nearest multiple of significance.
- **MUNIT:** Returns the unit matrix or the specified dimension.
- **SEC:** Returns the secant of an angle.
- **SECH:** Returns the hyperbolic secant of an angle.

Statistical Functions

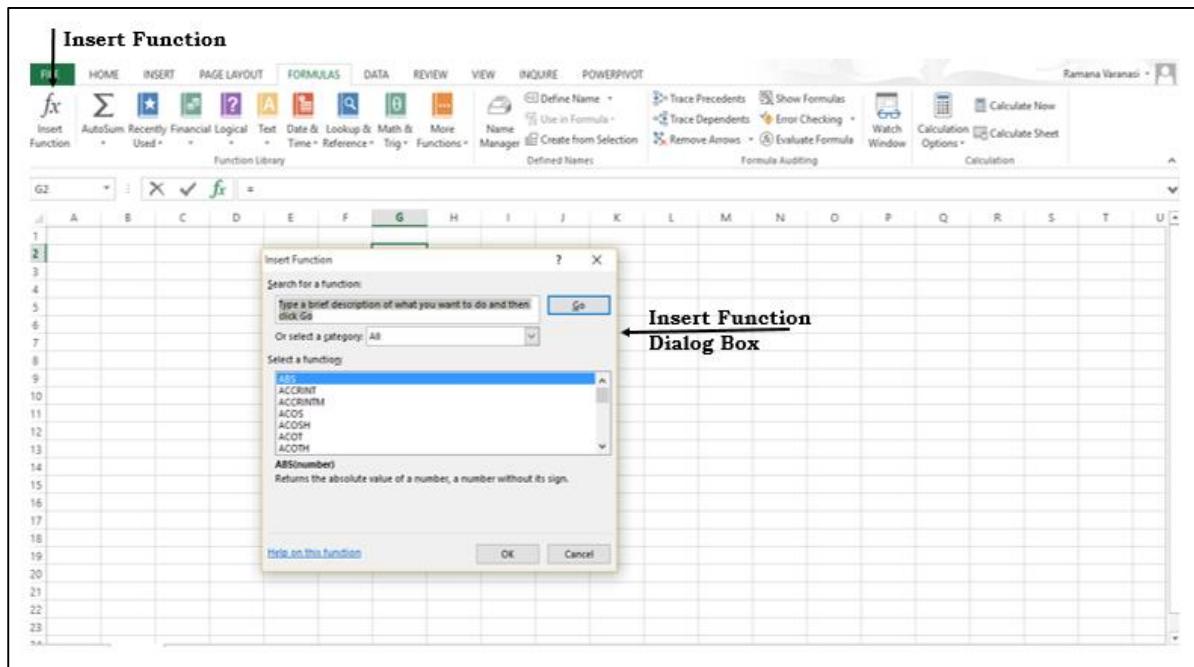
- **BINOM.DIST.RANGE:** Returns the probability of a trial result using a binomial distribution.
- **GAMMA:** Returns the Gamma function value.
- **GAUSS:** Returns 0.5 less than the standard normal cumulative distribution.
- **PERMUTATIONA:** Returns the number of permutations for a given number of objects (with repetitions) that can be selected from the total objects.
- **PHI:** Returns the value of the density function for a standard normal distribution.
- **SKEW.P:** Returns the skewness of a distribution based on a population: a characterization of the degree of asymmetry of a distribution around its mean.

Text Functions

- **DBCS:** Changes half-width (single-byte) English letters or katakana within a character string to full-width (double-byte) characters.
- **NUMBERVALUE:** Converts text to number in a locale-independent manner.
- **UNICHAR:** Returns the Unicode character that is references by the given numeric value.
- **UNICODE:** Returns the number (code point) that corresponds to the first character of the text.

User Defined Functions in Add-ins

The **Add-ins** that you install contain Functions. These add-in or automation functions will be available in the **User Defined** category in the **Insert Function** dialog box.



- **CALL:** Calls a procedure in a dynamic link library or code resource.
- **EUROCONVERT:** Converts a number to euros, converts a number from euros to a euro member currency, or converts a number from one euro member currency to another by using the euro as an intermediary (triangulation).
- **REGISTER.ID:** Returns the register ID of the specified dynamic link library (DLL) or code resource that has been previously registered.
- **SQL.REQUEST:** Connects with an external data source and runs a query from a worksheet, then returns the result as an array without the need for macro programming.

Web Functions

The following web functions are introduced in Excel 2013.

- **ENCODEURL:** Returns a URL-encoded string.
- **FILTERXML:** Returns specific data from the XML content by using the specified XPath.
- **WEBSERVICE:** Returns the data from a web service.

Part 2: Fundamental Data Analysis

7. Instant Data Analysis

In Microsoft Excel 2013, it is possible to do data analysis with quick steps. Further, different analysis features are readily available. This is through the Quick Analysis tool.

Quick Analysis Features

Excel 2013 provides the following analysis features for instant data analysis.

Formatting

Formatting allows you to highlight the parts of your data by adding things like data bars and colors. This lets you quickly see high and low values, among other things.

Charts

Charts are used to depict the data pictorially. There are several types of charts to suit different types of data.

Totals

Totals can be used to calculate the numbers in columns and rows. You have functions such as Sum, Average, Count, etc. which can be used.

Tables

Tables help you to filter, sort and summarize your data. The **Table** and **PivotTable** are a couple of examples.

Sparklines

Sparklines are like tiny charts that you can show alongside your data in the cells. They provide a quick way to see the trends.

Quick Analysis of Data

Follow the steps given below for quickly analyzing the data.

Step 1: Select the cells that contain the data you want to analyze.

A screenshot of Microsoft Excel showing a table titled "First Quarter Exam Scores". The table contains data for five students across four exams. The range A3:E8 is selected, indicated by a green border. A black arrow points from the text "Selected Data" to the bottom right corner of the selected range.

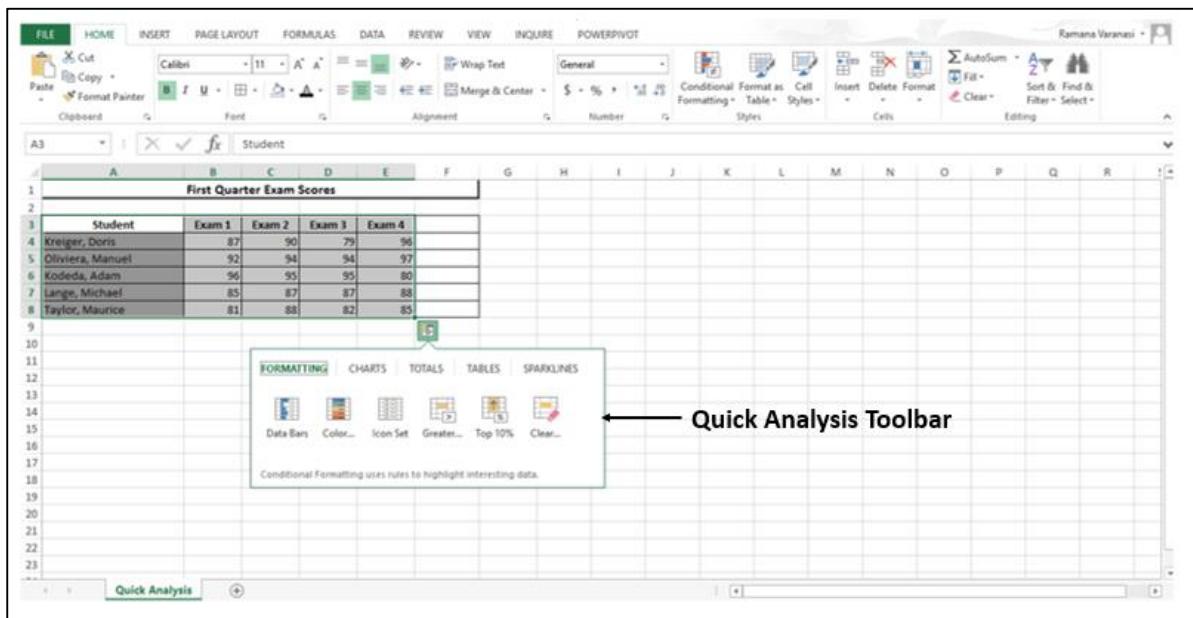
Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	94	97
Kodeda, Adam	96	95	95	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

A **Quick Analysis** button  appears to the bottom right of your selected data.

A screenshot of Microsoft Excel showing the same table of student exam scores. The range A3:E8 is selected. A black arrow points from the text "Quick Analysis Button" to the small blue square icon located at the bottom right corner of the selected range.

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	94	97
Kodeda, Adam	96	95	95	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 2: Click the **Quick Analysis**  button that appears (or press CTRL + Q). The Quick Analysis toolbar appears with the options of **FORMATTING, CHARTS, TOTALS, TABLES and SPARKLINES**.



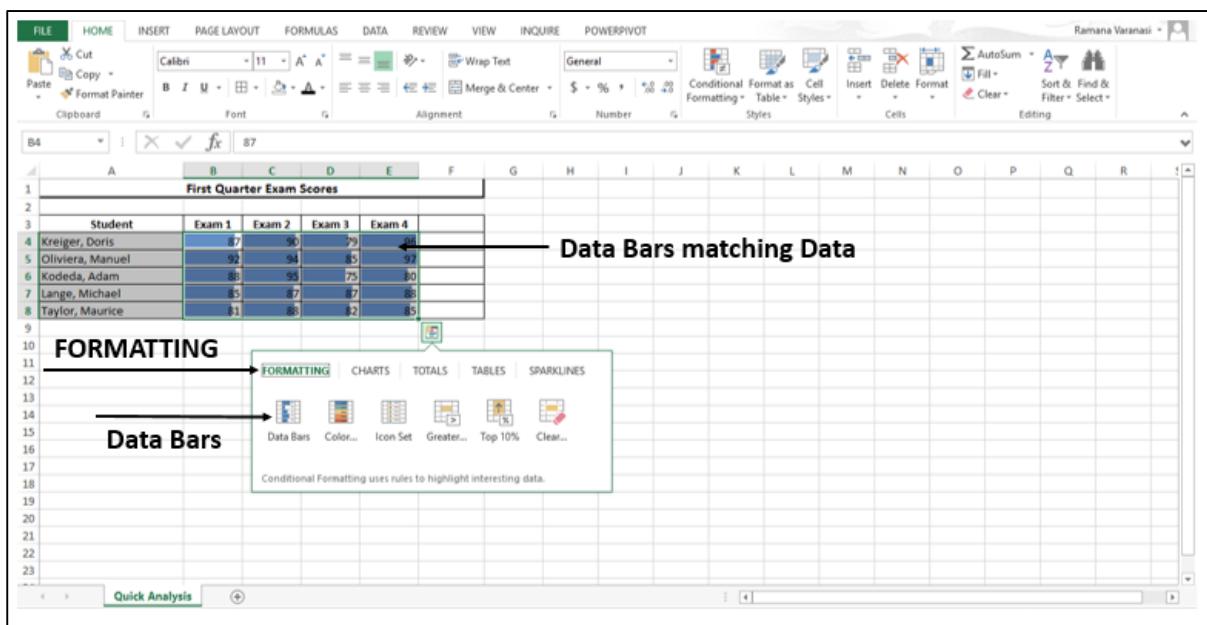
Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	94	97
Kodeda, Adam	96	95	95	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Conditional Formatting

Conditional formatting uses the rules to highlight the data. This option is available on the **Home tab** also, but with quick analysis it is handy and quick to use. Also, you can have a preview of the data by applying different options, before selecting the one you want.

Step 1: Click on the **FORMATTING** button.

Step 2: Click on **Data Bars**.



Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

The colored Data Bars that match the values of the data appear.

Step 3: Click on **Color Scale**.

A screenshot of Microsoft Excel showing a table of 'First Quarter Exam Scores'. The table has columns for Student and Exam 1 through Exam 4. The data is color-coded using conditional formatting. A callout points to the 'Color...' button in the 'Formatting' tab of the Quick Analysis ribbon, which is highlighted with a green box. The text 'Cells colored as per Data' is displayed next to the table.

First Quarter Exam Scores					
	Student	Exam 1	Exam 2	Exam 3	Exam 4
4	Kreiger, Doris	87	90	79	96
5	Oliviera, Manuel	92	94	85	97
6	Kodeda, Adam	88	95	75	80
7	Lange, Michael	85	87	87	88
8	Taylor, Maurice	81	88	82	85

Quick Analysis FORMATTING CHARTS TOTALS TABLES SPARKLINES

Data Bars Color... Icon Set Greater... Top 10% Clear...

Color Scale

The cells will be colored to the relative values as per the data they contain.

Step 4: Click on the **Icon Set**. The icons assigned to the cell values will be displayed.

A screenshot of Microsoft Excel showing the same table of exam scores. The data is now represented by icons from the 'Icon Set' conditional formatting rule. A callout points to the 'Icon Set' button in the 'Formatting' tab of the Quick Analysis ribbon, which is highlighted with a green box. The text 'Icons assigned cell values' is displayed next to the table.

First Quarter Exam Scores					
	Student	Exam 1	Exam 2	Exam 3	Exam 4
4	Kreiger, Doris	87	90	79	96
5	Oliviera, Manuel	92	94	85	97
6	Kodeda, Adam	88	95	75	80
7	Lange, Michael	85	87	87	88
8	Taylor, Maurice	81	88	82	85

Quick Analysis FORMATTING CHARTS TOTALS TABLES SPARKLINES

Data Bars Color... Icon Set Greater... Top 10% Clear...

Icon Set

Step 5: Click on the option-Greater than.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes columns for Student and four exam scores (Exam 1, Exam 2, Exam 3, Exam 4). A green callout box highlights the "Greater..." button in the "Formatting" tab of the ribbon's "Conditional Formatting" section. An arrow points from the text "Values Greater than a particular Value" to this button. Another arrow points from the text "Greater than" to the "Greater..." button in the dialog box.

First Quarter Exam Scores				
Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Values greater than a value set by Excel will be colored. You can set your own value in the Dialog Box that appears.

The screenshot shows the same Excel spreadsheet with the "Greater Than" dialog box open. The dialog box has a yellow border and contains the text "Format cells that are GREATER THAN:" followed by a text input field containing "86" and a dropdown menu showing "Light Red Fill with Dark Red Text". An arrow points from the text "Set the Value" to the input field. Another arrow points from the text "Dialog Box" to the dialog box itself.

First Quarter Exam Scores				
Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 6: Click on Top 10%.

The screenshot shows the Microsoft Excel interface with a table titled "First Quarter Exam Scores". The table has columns for Student and Exam 1 through Exam 4. A callout arrow points from the text "Values that are in 10%" to the cell containing the value 96 in Exam 4. Another callout arrow points from the text "Top 10%" to the "Top 10%" button in the "Conditional Formatting" section of the "Quick Analysis" tool.

First Quarter Exam Scores				
Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Values that are in top 10% will be colored.

Step 7: Click on **Clear Formatting**.

The screenshot shows the Microsoft Excel interface with the same table. A callout arrow points from the text "Formatting is cleared on the Data" to the cell containing the value 96 in Exam 4. Another callout arrow points from the text "Clear Formatting" to the "Clear..." button in the "Conditional Formatting" section of the "Quick Analysis" tool.

First Quarter Exam Scores				
Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Whatever formatting is applied will be cleared.

Step 8: Move the mouse over the **FORMATTING options**. You will have a preview of all the formatting for your Data. You can choose whatever best suits your data.

Charts

Recommended **Charts** help you visualize your **Data**.

Step 1: Click on **CHARTS**. **Recommended Charts** for your data will be displayed.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes student names and their scores across four exams. The "CHARTS" tab is selected in the ribbon. A callout box labeled "Recommended Charts" points to a preview of a clustered bar chart showing the exam scores for each student.

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 2: Move over the charts recommended. You can see the Previews of the Charts.

The screenshot shows the same Excel spreadsheet with a preview of a recommended chart overlaid. The chart is a clustered horizontal bar chart titled "Chart Title" showing the distribution of exam scores for each student. The preview is labeled "Preview of the Recommended Chart".

Student	Exam 1
Kreiger, Doris	87
Oliviera, Manuel	92
Kodeda, Adam	88
Lange, Michael	85
Taylor, Maurice	81

Step 3: Click on **More** as shown in the image given below.

The screenshot shows the Microsoft Excel interface with the 'HOME' tab selected in the ribbon. A data table titled 'First Quarter Exam Scores' is displayed in the worksheet area. In the ribbon, under the 'CHARTS' tab, there is a 'Recommended Charts' section. A callout box highlights the 'More...' button in this section, which is part of a larger 'More Recommended Charts' dropdown menu. The menu also includes options like 'Clustere...', 'Stacked...', 'Clustered...', 'Stacked...', and 'Clustered...'. Below the menu, a note says 'Recommended Charts help you visualize data.'

More Recommended Charts are displayed.

The screenshot shows the Microsoft Excel interface with the 'HOME' tab selected in the ribbon. A data table titled 'First Quarter Exam Scores' is displayed in the worksheet area. In the ribbon, under the 'CHARTS' tab, there is a 'Recommended Charts' section. A callout box highlights the 'More Recommended Charts' section in the ribbon, which is part of a larger 'More Recommended Charts' dropdown menu. The menu includes various chart types such as Clustered Bar, Stacked Bar, Clustered Column, Stacked Column, Clustered Line, Stacked Line, Scatter, and more. A sample scatter plot is shown in the dialog box, comparing Exam 2 and Exam 4 scores. The dialog box has 'OK' and 'Cancel' buttons at the bottom.

Totals

Totals help you to calculate the numbers in rows and columns.

Step 1: Click on **TOTALS**. All the options available under **TOTALS** options are displayed. The little black arrows on the right and left are to see additional options.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes student names and their scores across four exams. The "TOTALS" button in the ribbon is highlighted. A callout bubble points to the "Sum" icon in the dropdown menu with the text "Little Arrow to see Additional Options". The "TOTALS Options" section is also visible.

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 2: Click on the **Sum** icon. This option is used to sum the numbers in the columns.

The screenshot shows the same Microsoft Excel spreadsheet. The "Sum" icon in the "TOTALS" dropdown menu is highlighted. A callout bubble points to the "Sum" icon with the text "Sum of Columns".

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 3: Click on **Average**. This option is used to calculate the average of the numbers in the columns.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes student names and their scores across four exams. The "Average" button in the Quick Analysis tool is highlighted with a green box. A callout bubble labeled "Average" points to this button. The formula bar shows the formula =AVERAGE(B9:D9) for cell E9.

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 4: Click on **Count**. This option is used to count the number of values in the column.

The screenshot shows the same Microsoft Excel spreadsheet as above. The "Count" button in the Quick Analysis tool is highlighted with a green box. A callout bubble labeled "Count" points to this button. The formula bar shows the formula =COUNT(B9:D9) for cell E9.

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 5: Click on **%Total**. This option is to compute the percent of the column that represents the total sum of the data values selected.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes student names and their scores across four exams. The "Quick Analysis" button is selected, displaying a gallery with various options like Sum, Average, Count, % Total, Running..., and Sum. The "% Total" option is highlighted with a green box and a callout bubble labeled "% of column in the Total".

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 6: Click on **Running Total**. This option displays the **Running Total** of each column.

The screenshot shows the same Microsoft Excel spreadsheet as above. The "Quick Analysis" button is selected, displaying the same gallery of options. The "Running..." option is highlighted with a green box and a callout bubble labeled "Running Total of the Column".

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

Step 7: Click on **Sum**. This option is to sum the numbers in the rows.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes columns for Student, Exam 1, Exam 2, Exam 3, Exam 4, and Sum. A green callout points to the "Sum" button in the "TOTALS" tab of the Quick Analysis tool, which is overlaid on the formula bar. The "Sum" button is highlighted with a green border. The formula bar also displays the formula =SUM(E4:E8).

Student	Exam 1	Exam 2	Exam 3	Exam 4	Sum
Kreiger, Doris	87	90	79	96	352
Oliviera, Manuel	92	94	85	97	368
Kodeda, Adam	88	95	75	80	338
Lange, Michael	85	87	87	88	347
Taylor, Maurice	81	88	82	85	336

Step 8: Click on the symbol . This displays more options to the right.

The screenshot shows the same Microsoft Excel spreadsheet as the previous step. A green callout points to the right-pointing arrow in the "TOTALS" tab of the Quick Analysis tool. This arrow indicates that clicking it will reveal additional options for calculating totals, such as Average, Count, % Total, and Running Total.

Student	Exam 1	Exam 2	Exam 3	Exam 4	
Kreiger, Doris	87	90	79	96	
Oliviera, Manuel	92	94	85	97	
Kodeda, Adam	88	95	75	80	
Lange, Michael	85	87	87	88	
Taylor, Maurice	81	88	82	85	

Step 9: Click on **Average**. This option is to calculate the average of the numbers in the rows.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes columns for Student, Exam 1, Exam 2, Exam 3, Exam 4, and Average. The "Average" column contains the formula =AVERAGE(B4:D4). A callout box highlights the "Average" button in the "TOTALS" tab of the Quick Analysis tool, which is overlaid on the ribbon. The "Average" button is highlighted with a green arrow pointing to it.

Student	Exam 1	Exam 2	Exam 3	Exam 4	Average
Kreiger, Doris	87	90	79	96	88
Oliviera, Manuel	92	94	85	97	92
Kodeda, Adam	88	95	75	80	84.5
Lange, Michael	85	87	87	88	86.75
Taylor, Maurice	81	88	82	85	84

Step 10: Click on **Count**. This option is to count the number of values in the rows.

The screenshot shows the same "First Quarter Exam Scores" spreadsheet. The "Count" column contains the formula =COUNT(B4:D4). A callout box highlights the "Count" button in the "TOTALS" tab of the Quick Analysis tool, which is overlaid on the ribbon. The "Count" button is highlighted with a green arrow pointing to it.

Student	Exam 1	Exam 2	Exam 3	Exam 4	Count
Kreiger, Doris	87	90	79	96	4
Oliviera, Manuel	92	94	85	97	4
Kodeda, Adam	88	95	75	80	4
Lange, Michael	85	87	87	88	4
Taylor, Maurice	81	88	82	85	4

Step 11: Click on %Total.

This option is to compute the percent of the row that represents the total sum of the data values selected.

Student	Exam 1	Exam 2	Exam 3	Exam 4	% Total
Kreiger, Doris	87	90	79	96	20.22%
Oliviera, Manuel	92	94	85	97	21.14%
Kodeda, Adam	88	95	75	80	19.41%
Lange, Michael	85	87	87	88	19.93%
Taylor, Maurice	81	88	82	85	19.30%

Step 12: Click on Running Total. This option displays the Running Total of each row.

Student	Exam 1	Exam 2	Exam 3	Exam 4	Running Total
Kreiger, Doris	87	90	79	96	352
Oliviera, Manuel	92	94	85	97	720
Kodeda, Adam	88	95	75	80	1058
Lange, Michael	85	87	87	88	1405
Taylor, Maurice	81	88	82	85	1741

Tables

Tables help you sort, filter and summarize the data.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data consists of student names in column A and exam scores in columns B through E. The "TABLES" tab is highlighted in the ribbon, and a callout box points to it with the text "Tables help you sort, filter, and summarize data." The status bar at the bottom shows "AVERAGE: 87.05" and "COUNT: 30".

Student	Exam 1	Exam 2	Exam 3	Exam 4
Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	95	75	80
Lange, Michael	85	87	87	88
Taylor, Maurice	81	88	82	85

The options in the **TABLES** depend on the data you have chosen and may vary.

Step 1: Click on **TABLES**.

Step 2: Hover on the **Table** icon. A preview of the Table appears.

The screenshot shows the same Excel spreadsheet with the "TABLES" tab selected. A preview of the table is displayed below the ribbon, showing the student names and exam scores with dropdown arrows indicating filterable fields. The "Table" icon in the ribbon is also highlighted. A callout box points to the preview with the text "Preview of Table". The status bar at the bottom shows "AVERAGE: 87.05" and "COUNT: 30".

Student	Exam 1	Student	Exam 2	Exam 3	Exam 4	
Kreiger, Doris	87	Kreiger, Doris	87	90	79	96
Oliviera, Manuel	92	Oliviera, Manuel	92	94	85	97
Kodeda, Adam	88	Kodeda, Adam	88	95	75	80
Lange, Michael	85	Lange, Michael	85	87	87	88
Taylor, Maurice	81	Taylor, Maurice	81	88	82	85

Step 3: Click on **Table**. The **Table** is displayed. You can sort and filter the data using this feature.

The screenshot shows a Microsoft Excel spreadsheet titled "Analysis.xlsx - Excel". A table is selected, highlighted by a green border. The table has a header row and contains data for eight students across five exams. The "Table Tools" ribbon is open, with the "DESIGN" tab selected. A callout arrow points to the table area with the label "Table".

First Quarter Exam Scores					
Student	Exam	Exam	Exam	Exam	Exam
Kreiger, Doris	87	90	79	96	
Oliviera, Manuel	92	94	85	97	
Kodeda, Adam	88	95	75	80	
Lange, Michael	85	87	87	88	
Taylor, Maurice	81	88	82	85	

Step 4: Click on the **Pivot Table** to create a pivot table. Pivot Table helps you to summarize your data.

The screenshot shows a Microsoft Excel spreadsheet with the "Pivot Table" icon highlighted in the "Tables" section of the ribbon. A callout arrow points to the icon with the label "Pivot Table".

First Quarter Exam Scores					
Student	Exam	Exam	Exam	Exam	Exam
Kreiger, Doris	87	90	79	96	
Oliviera, Manuel	92	94	85	97	
Kodeda, Adam	88	95	75	80	
Lange, Michael	85	87	87	88	
Taylor, Maurice	81	88	82	85	

Sparklines

SPARKLINES are like tiny charts that you can show alongside your data in cells. They provide a quick way to show the trends of your data.

Step 1: Click on **SPARKLINES**. The chart options displayed are based on the data and may vary.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data includes columns for Student names and four exam scores. A "Sparklines" ribbon tab is highlighted, and a callout box labeled "SPARKLINES" points to it. Below the ribbon, another callout box labeled "Chart Options" points to the "Line" icon in a group of three chart icons (Line, Column, Win/Loss).

Student	Exam 1	Exam 2	Exam 3	Exam 4	Sparklines
Kreiger, Doris	87	90	79	96	
Oliviera, Manuel	92	94	85	97	
Kodeda, Adam	88	95	75	80	
Lange, Michael	85	87	87	88	
Taylor, Maurice	81	88	82	85	

Step 2: Click on **Line**. A line chart for each row is displayed.

The screenshot shows the same Excel spreadsheet with the "Line" chart option selected in the "SPARKLINES" ribbon tab. A callout box labeled "Sparklines – Line Charts" points to the "Line" icon. The data rows now feature small line charts in their respective cells, indicating the trend of the student's exam scores over time.

Student	Exam 1	Exam 2	Exam 3	Exam 4	Sparklines
Kreiger, Doris	87	90	79	96	
Oliviera, Manuel	92	94	85	97	
Kodeda, Adam	88	95	75	80	
Lange, Michael	85	87	87	88	
Taylor, Maurice	81	88	82	85	

Step 3: Click on the **Column** icon.

The screenshot shows a Microsoft Excel spreadsheet titled "First Quarter Exam Scores". The data consists of 8 rows of student names and their exam scores across four exams. Each row contains a sparkline chart in the "Sparklines" column. A callout box points to the "Column" icon in the "CHARTS" tab of the "SPARKLINES" ribbon. The callout box also contains the text: "Sparklines are mini charts placed in single cells." The "Column" icon is highlighted with a green box and an arrow pointing to it.

	A	B	C	D	E	F
1	First Quarter Exam Scores					
2	Student	Exam 1	Exam 2	Exam 3	Exam 4	Sparklines
3	Kreiger, Doris	87	90	79	96	
4	Oliviera, Manuel	92	94	85	97	
5	Kodeda, Adam	88	95	75	80	
6	Lange, Michael	85	87	87	88	
7	Taylor, Maurice	81	88	82	85	
8						

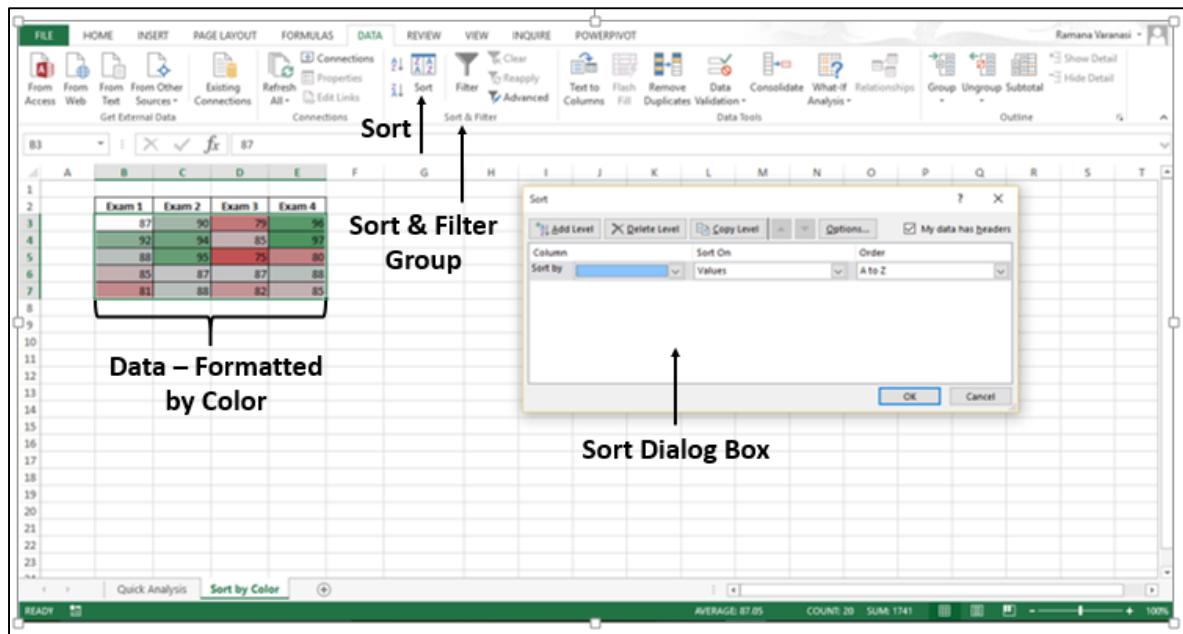
A line chart for each row is displayed.

8. Excel – Sorting Data by Color

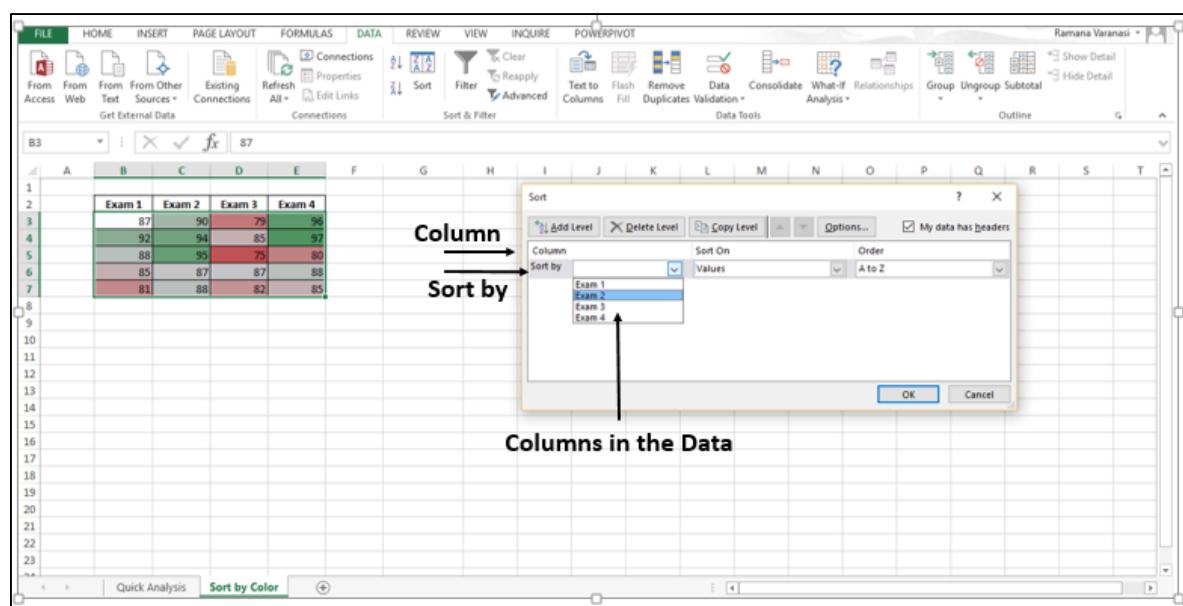
If you have formatted a table column, manually or conditionally, with the cell color or font color, you can also sort by these colors.

Step 1: Click on the **DATA** tab.

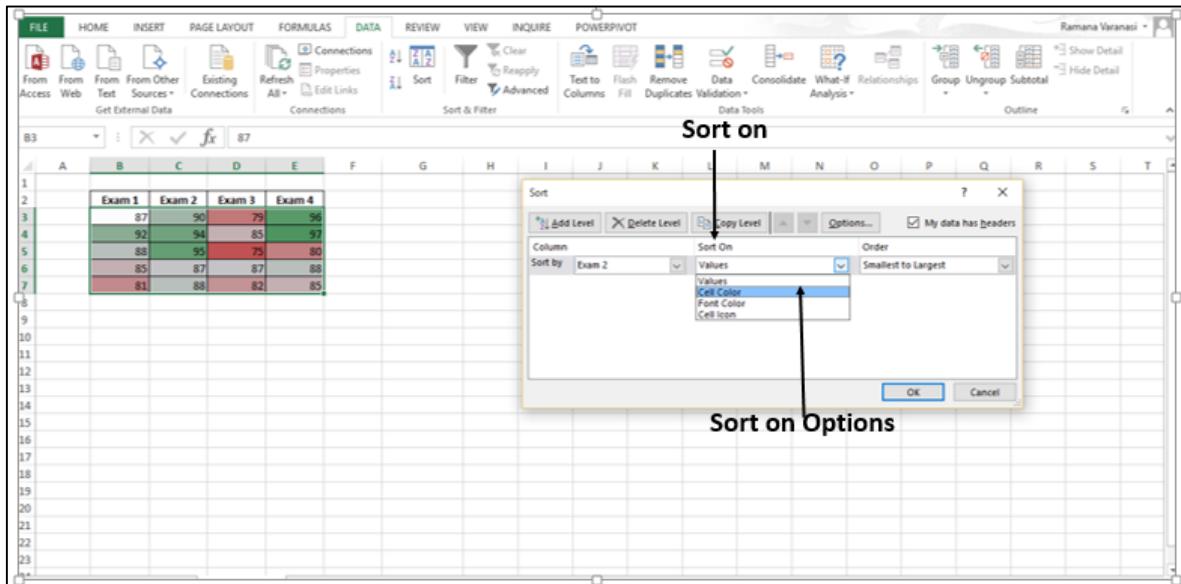
Step 2: Click on **Sort** in the **Sort & Filter** group. The **Sort** dialog box appears.



Step 3: Under the **Column** option, in the **Sort by** box, select the column that you want to sort. For example, click on Exam 2 as shown in the image given below.

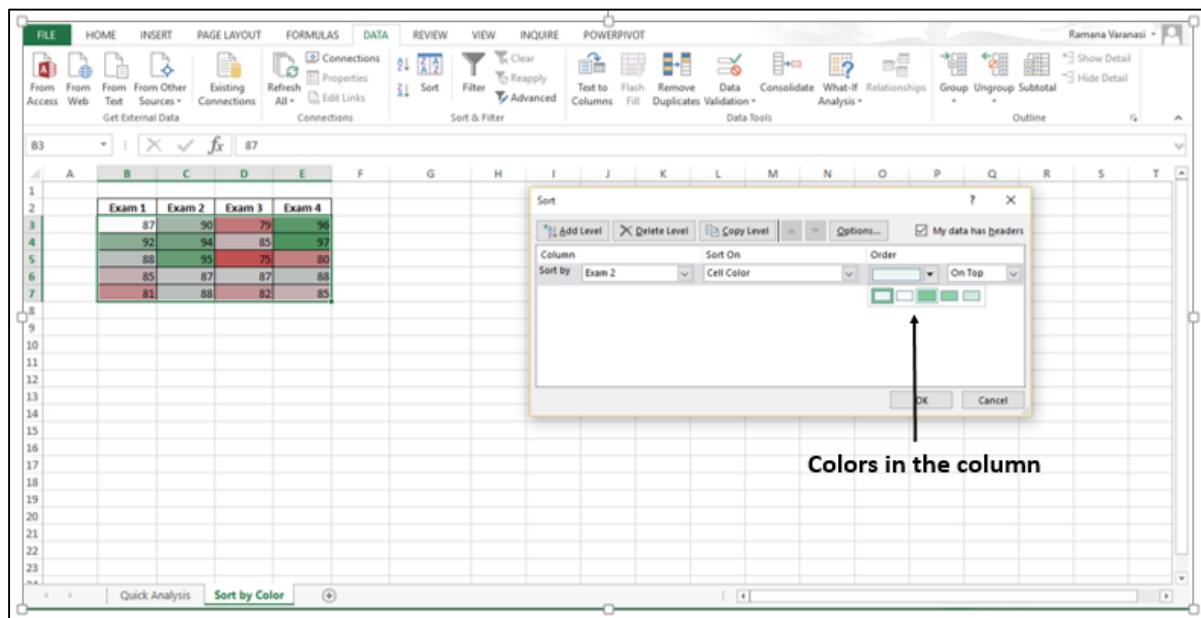


Step 4: Under the topic **Sort On**, select the type of sort. To sort by cell color, select **Cell Color**. To sort by font color, select **Font Color**.



Step 5: Click on the option **Cell Color**.

Step 6: Under **Order**, click the arrow next to the button. The colors in that column are displayed.



Step 7: You must define the order that you want for each sort operation because there is no default sort order. To move the cell color to the top or to the left, select **On Top** for column sorting and **On Left** for row sorting. To move the cell color to the bottom or to the right, select **On Bottom** for column sorting and **On Right** for row sorting.

The screenshot shows a Microsoft Excel spreadsheet with data in columns B through E. The first row contains headers: Exam 1, Exam 2, Exam 3, and Exam 4. The subsequent rows contain numerical values. A 'Sort' dialog box is open over the spreadsheet. In the 'Sort On' dropdown, 'Cell Color' is selected. In the 'Order' dropdown, 'On Top' is highlighted. A callout arrow labeled 'Sort Order' points to the 'On Top' option in the dropdown menu. The Excel ribbon is visible at the top, showing the 'DATA' tab is selected. The status bar at the bottom indicates 'Sort by Color'.

	B	C	D	E
1	Exam 1	Exam 2	Exam 3	Exam 4
2	87	90	79	96
3	92	94	85	97
4	88	95	75	80
5	85	87	87	88
6	81	88	82	85

9. Excel – Slicers

Slicers were introduced in Excel 2010 to filter the data of pivot table. In Excel 2013, you can create **Slicers to filter your table data** also.

A **Slicer** is useful because it clearly indicates what data is shown in your table after you filter your data.

Step 1: Click in the **Table. TABLE TOOLS** tab appears on the ribbon.

The screenshot shows a Microsoft Excel window with the 'Table Tools' ribbon selected. A cursor is positioned over the first cell of a table. The table contains the following data:

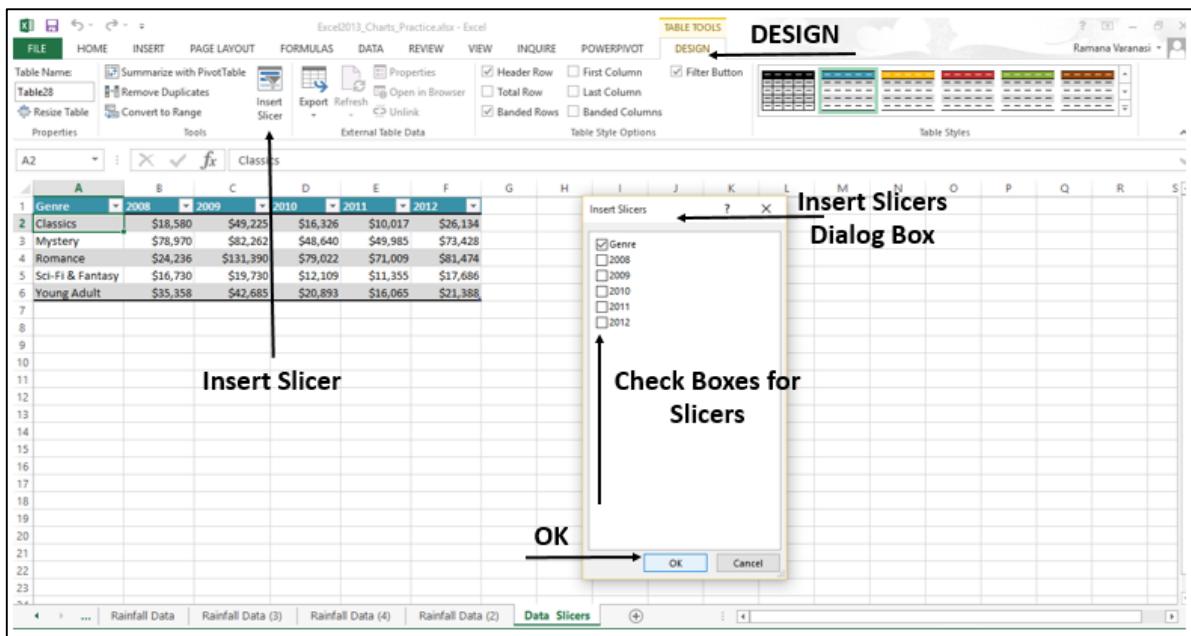
Genre	2008	2009	2010	2011	2012
Classics	\$18,580	\$49,225	\$16,326	\$10,017	\$26,134
Mystery	\$78,970	\$82,262	\$48,640	\$49,985	\$73,428
Romance	\$24,236	\$131,390	\$79,022	\$71,009	\$81,474
Sci-Fi & Fantasy	\$16,730	\$19,730	\$12,109	\$11,355	\$17,686
Young Adult	\$35,358	\$42,685	\$20,893	\$16,065	\$21,388

Step 2: Click on **DESIGN**. The options for **DESIGN** appear on the ribbon.

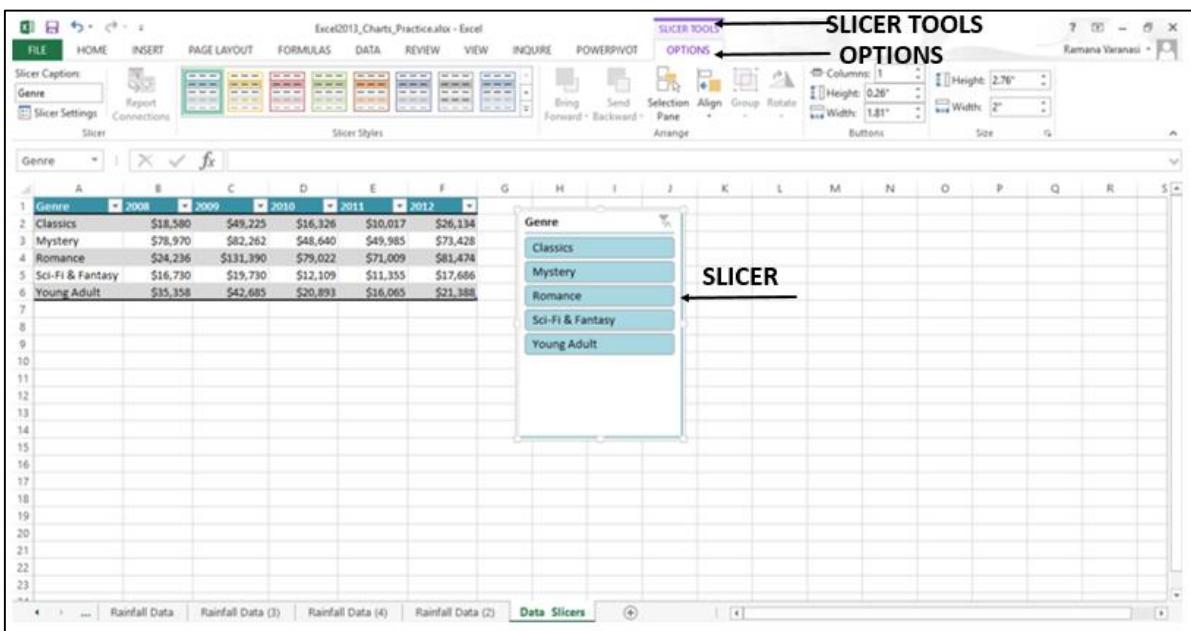
Step 3: Click on **Insert Slicer**. A **Insert Slicers** dialog box appears.

Step 4: Check the boxes for which you want the slicers. Click on **Genre**.

Step 5: Click **OK**.



The slicer appears. **Slicer tools** appear on the ribbon. Clicking the **OPTIONS** button, provides various **Slicer** Options.



Step 6: In the **slicer**, click the items you want to display in your table. To choose more than one item, hold down CTRL, and then pick the items you want to show.

The screenshot shows an Excel spreadsheet titled "Excel2013_Charts_Practice.xlsx". On the left, there is a table with columns for Year (2008-2012) and Genre (Classics, Mystery, Romance, Sci-Fi & Fantasy). On the right, a "Slicer" is displayed with the following items: Classics, Mystery, Romance, Sci-Fi & Fantasy, and Young Adult. The first four items (Classics, Mystery, Romance, and Sci-Fi & Fantasy) are highlighted with a blue background, indicating they are selected. A bracket on the right side of the slicer is labeled "Selected Items", pointing to these four items. The "Slicer Tools" ribbon tab is selected, showing options for arranging and sizing the slicer.

	A	B	C	D	E	F
1	Genre	2008	2009	2010	2011	2012
2	Classics	\$18,580	\$49,225	\$16,326	\$10,017	\$26,134
3	Mystery	\$78,970	\$82,262	\$48,640	\$49,985	\$73,428
4	Sci-Fi & Fantasy	\$16,730	\$19,730	\$12,109	\$11,355	\$17,686

10. Excel – Flash Fill

Flash Fill helps you to separate first and last names or part names and numbers, or any other data into separate columns.

Step 1: Consider a data column containing full names.

The screenshot shows a Microsoft Excel spreadsheet titled "Sheet1". In the first row, there are three columns: "Full Name", "First Name", and "Last Name". Below this header, there are seven rows of data. The "Full Name" column contains the following names: Annik Stahl, Harry Miller, Josh Barnhill, Jonathan Foster, Doug Thomas, Ron Owens, and Colin Wilcox. The "First Name" and "Last Name" columns are currently empty. An annotation "Full Names" is placed over the first two columns of data. The Excel ribbon is visible at the top, showing various tabs like FILE, HOME, INSERT, etc., and the status bar on the right indicates "Ramana Varanasi".

Step 2: Enter the first name in the column next to your data and press Enter.

This screenshot shows the same Excel spreadsheet after the first name has been entered. Cell C3, which was previously empty, now contains the text "Annik". The cell is highlighted with a red border. The text "First Name" is overlaid on the screen. The rest of the data in columns A and B remains the same as in the previous step. The Excel ribbon and status bar are visible at the top.

Step 3: Start typing the next name. **Flash Fill** will show you a list of suggested names.

The screenshot shows an Excel spreadsheet with data in columns A, B, and C. Column A contains names, column B contains first names, and column C contains last names. In cell C4, the user has typed 'Harry'. A tooltip labeled 'Started Typing' appears above the cell. Below the cell, a list of suggested names is shown: Harry Miller, Josh Barnhill, Jonathan Foster, Doug Thomas, Ron Owens, and Colin Wilcox. The list is labeled 'List of Suggested Names'.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1					Started														
2			Full Name	First Name	Last Name														
3	Annik Stahl	Annik																	
4	Harry Miller	Harry																	
5	Josh Barnhill	Josh																	
6	Jonathan Foster	Jonathan																	
7	Doug Thomas	Doug																	
8	Ron Owens	Ron																	
9	Colin Wilcox	Colin																	
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			

Step 4: Press Enter to accept the list.

The screenshot shows the same Excel spreadsheet after pressing Enter. The data in column C has been populated with the suggested names: Harry Miller, Josh Barnhill, Jonathan Foster, Doug Thomas, Ron Owens, and Colin Wilcox. A tooltip labeled 'Data filled with Flash Fill' is centered over the now-filled column C.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1																			
2			Full Name	First Name	Last Name														
3	Annik Stahl	Annik																	
4	Harry Miller	Harry																	
5	Josh Barnhill	Josh																	
6	Jonathan Foster	Jonathan																	
7	Doug Thomas	Doug																	
8	Ron Owens	Ron																	
9	Colin Wilcox	Colin																	
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			

Step 5: Enter a last name in the next column, and press Enter.

The screenshot shows a Microsoft Excel spreadsheet titled 'Sheet1'. The data is organized into three columns: 'Full Name', 'First Name', and 'Last Name'. In the 'Last Name' column, the first cell contains 'Stahl'. A cursor is positioned over the cell at row 4, which contains 'Harry'. A horizontal arrow points from the text 'Last Name' to the cell containing 'Harry', indicating the action of entering the last name.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1																			
2				Full Name	First Name	Last Name													
3				Annik Stahl	Annik	Stahl													
4				Harry Miller	Harry														
5				Josh Barnhill	Josh														
6				Jonathan Foster	Jonathan														
7				Doug Thomas	Doug														
8				Ron Owens	Ron														
9				Colin Wilcox	Colin														
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			

Step 6: Start typing the next name and press Enter. The column will be filled with the relevant last names.

The screenshot shows a Microsoft Excel spreadsheet titled 'Sheet1'. The data is organized into three columns: 'Full Name', 'First Name', and 'Last Name'. In the 'Last Name' column, the first cell contains 'Stahl'. A cursor is positioned over the cell at row 5, which contains 'Miller'. A horizontal arrow points from the text 'Data filled with Flash Fill' to the cell containing 'Miller', indicating the result of using the Flash Fill feature.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1				Full Name	First Name	Last Name													
2				Annik Stahl	Annik	Stahl													
3				Harry Miller	Harry	Miller													
4				Josh Barnhill	Josh	Barnhill													
5				Jonathan Foster	Jonathan	Foster													
6				Doug Thomas	Doug	Thomas													
7				Ron Owens	Ron	Owens													
8				Colin Wilcox	Colin	Wilcox													
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			

Step 7: If the names have middle names also, you can still use **Flash Fill** to separate the data out into **three columns** by repeating it **three times**.

The screenshot shows a Microsoft Excel spreadsheet with the following data in rows 2 through 9:

	Full Name	First Name	Middle Name	Last Name
2	Annik A. Stahl	Annik	A.	stahl
3	Harry B. Miller	Harry	B.	Miller
4	Josh C. Barnhill	Josh	C.	Barnhill
5	Jonathan D. Foster	Jonathan	D.	Foster
6	Doug E. Thomas	Doug	E.	Thomas
7	Ron F. Owens	Ron	F.	Owens
8	Colin G. Wilcox	Colin	G.	Wilcox
9				

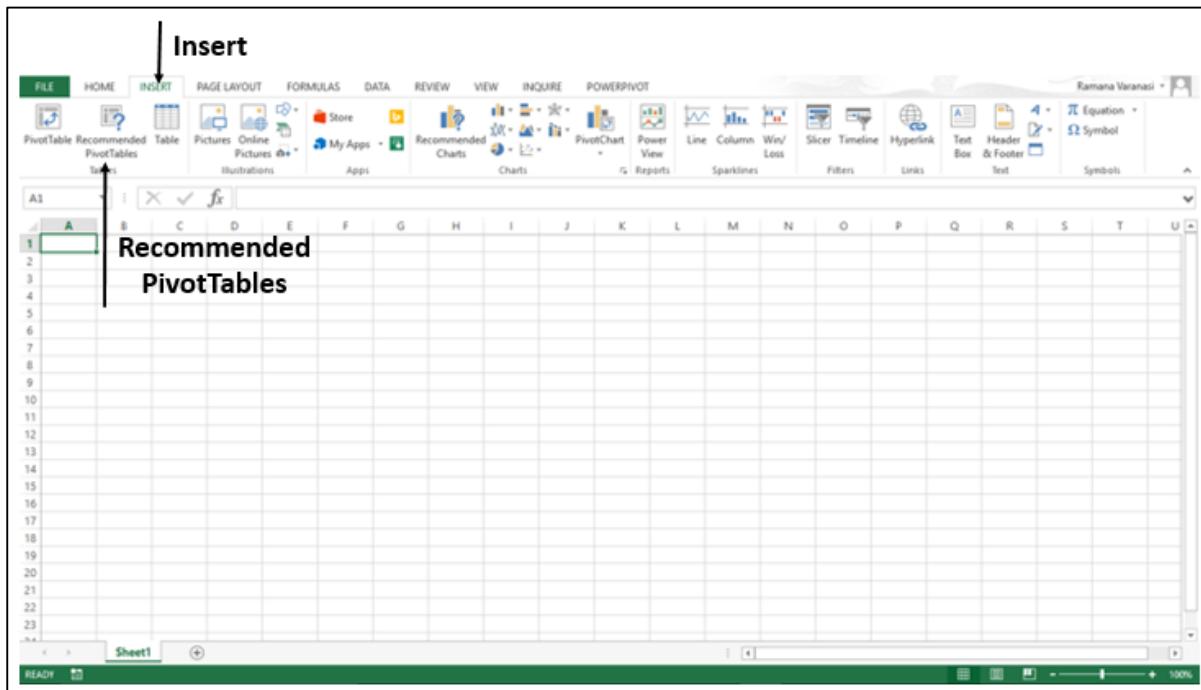
The 'Middle Name' column (Column D) contains partial names ('A.', 'B.', 'C.', 'D.', 'E.', 'F.', 'G.') which are highlighted with green boxes. Arrows point from the text 'Middle Name' to the first two cells in Column D, and from the text 'Data filled with Flash Fill' to the third and fourth cells in Column D. The formula bar at the top shows 'fx'.

Flash Fill works with any data you need to split into more than one column, or you can simply use it to fill out data based on an example. **Flash Fill** typically starts working when it recognizes a pattern in your data.

Part 3: Powerful Data Analysis – Introduction

11. Excel – PivotTable Recommendations

Excel 2013 has a new feature **Recommended PivotTables** under the **Insert** tab. This command helps you to create **PivotTables** automatically.



Step 1: Your data should have column headers. If you have data in the form of a table, the table should have Table Header. Make sure of the Headers.

Step 2: There should not be blank rows in the Data. Make sure No Rows are blank.

Step 3: Click on the Table.

Step 4: Click on **Insert tab**.

Step 5: Click on **Recommended PivotTables**. The **Recommended PivotTables** dialog box appears.

Step 6: Click on a **PivotTable Layout** that is recommended. A preview of that pivot table appears on the right-side.

PivotTable Preview

Recommended PivotTables

Salesperson	Region	Account	Order Amount
Albertson, Kathy	East	29386	\$925.00
Albertson, Kathy	East	74830	\$875.00
Albertson, Kathy	East	90099	\$500.00
Albertson, Kathy	East	74830	\$350.00
Brennan, Michael	West	82853	\$400.00
Brennan, Michael	West	72949	\$850.00
Brennan, Michael	West	90044	\$1,500.00
Brennan, Michael	West	82853	\$550.00
Brennan, Michael	West	72949	\$400.00
Davis, William	South	55223	\$235.00
Davis, William	South	10354	\$850.00
Davis, William	South	50192	\$600.00
Davis, William	South	27589	\$250.00
Dumlaoo, Richard	West	67275	\$400.00
Dumlaoo, Richard	West	41828	\$965.00
Dumlaoo, Richard	West	87543	\$125.00
Flores, Tia	South	97446	\$1,500.00
Flores, Tia	South	41400	\$305.00
Flores, Tia	South	30974	\$1,350.00
Flores, Tia	South	41400	\$435.00

Step 7: Double-click on the **PivotTable** that shows the data the way you want and Click **OK**. The PivotTable is created automatically for you on a new worksheet.

PivotTable Fields

Choose fields to add to report:

- Salesperson
- Region
- Account
- Order Amount
- Month

MORE TABLES...

Drag fields between areas below:

FILTERS	COLUMNS
ROWS	VALUES
Region	Sum of Accou...
Salesperson	

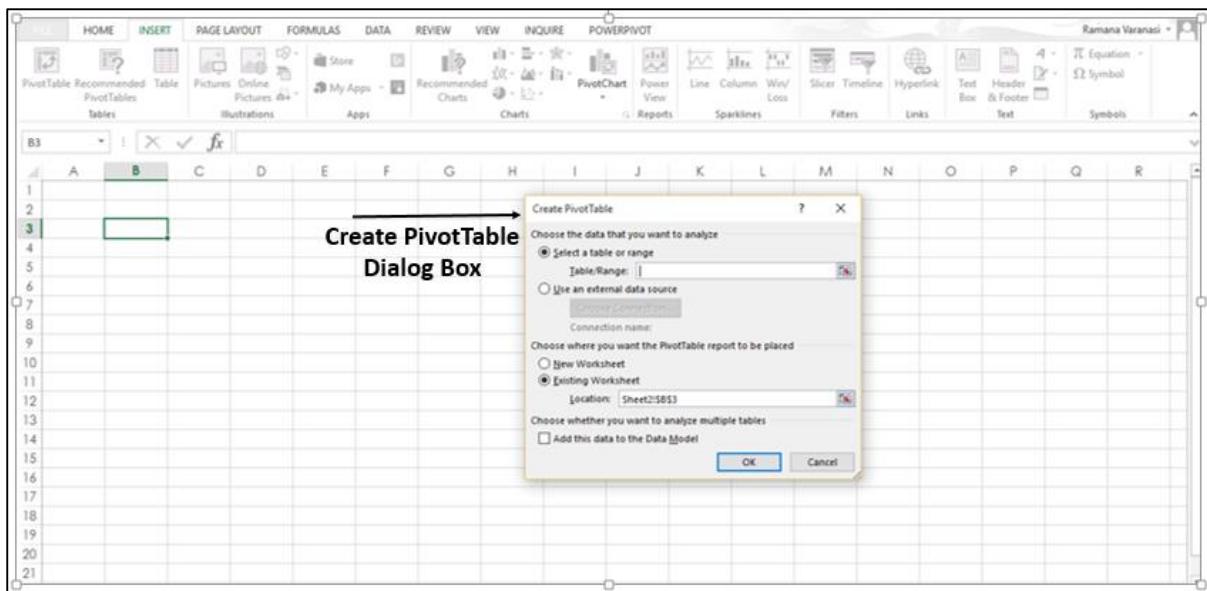
Create a PivotTable to analyze external data

Create a PivotTable by using an existing external data connection

Step 1: Click any cell in the Table.

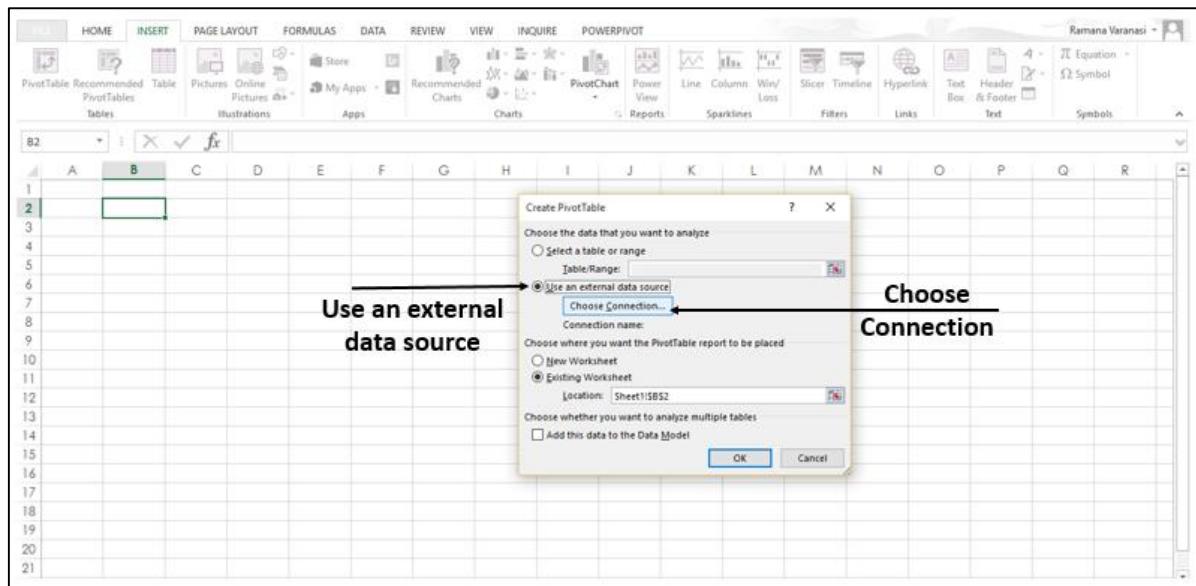
Step 2: Click on the **Insert** tab.

Step 3: Click on the **PivotTable** button. A **Create PivotTable** dialog box appears.

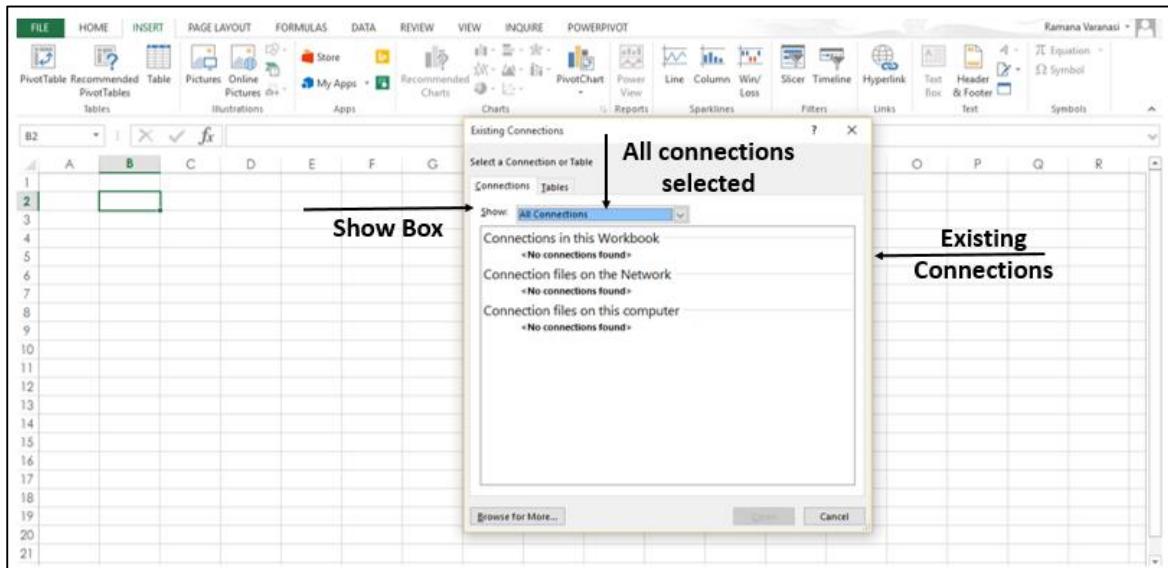


Step 4: Click on the option **Use an external data source**. The button below that, '**Choose Connection**' gets enabled.

Step 5: Select the **Choose Connection** option. A window appears showing all the **Existing Connections**.



Step 6: In the **Show** Box, select **All Connections**. All the available data connections can be used to obtain the data for analysis.



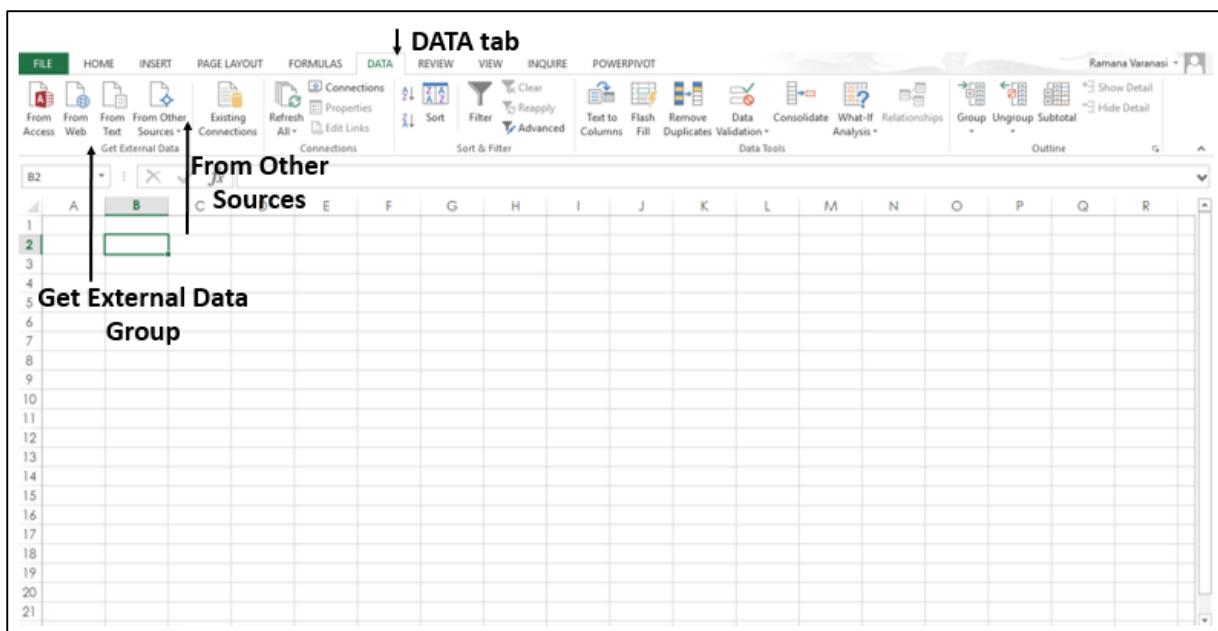
The option **Connections in this Workbook** option in the **Show Box** is to reuse or share an existing connection.

Connect to a new external data source

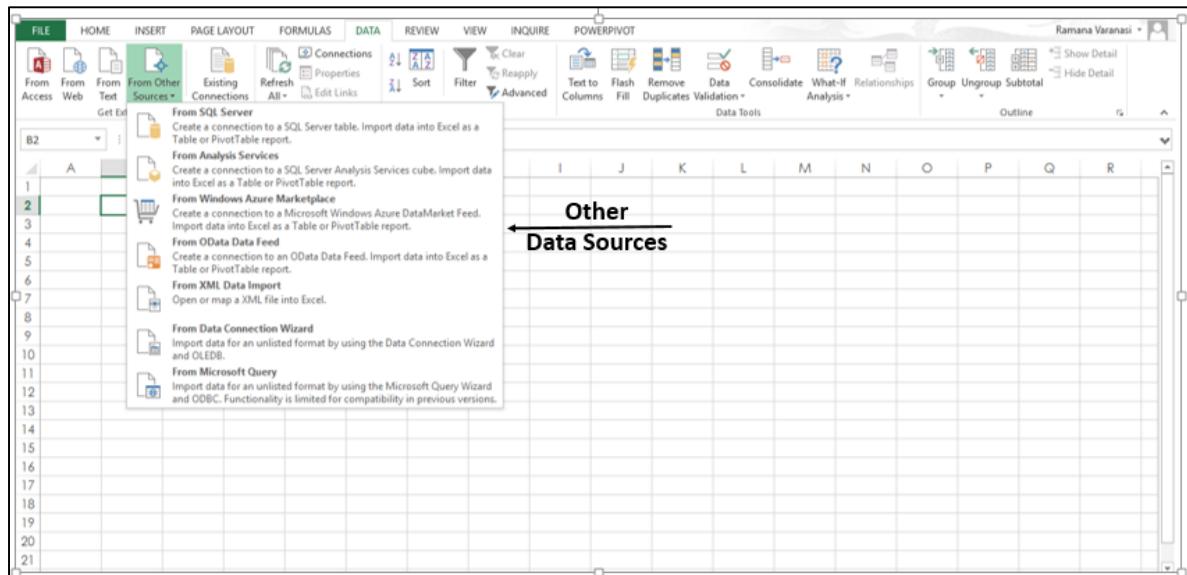
You can create a new external data connection to the SQL Server and import the data into Excel as a table or PivotTable.

Step 1: Click on the **Data** tab.

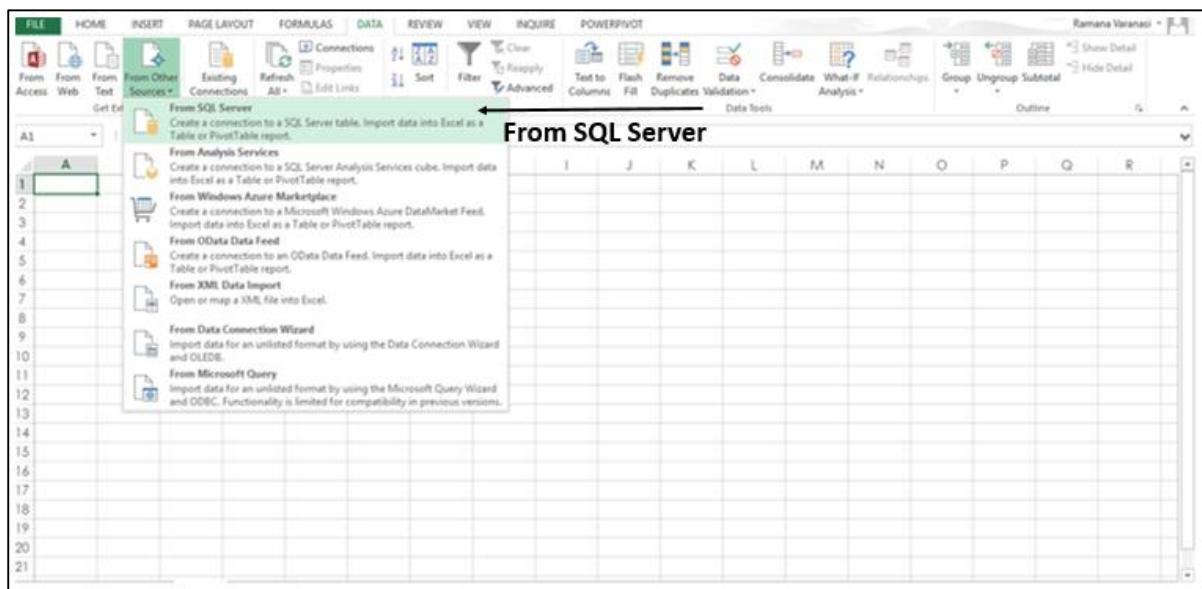
Step 2: Click on the **From Other Sources** button, in the Get External Data Group.



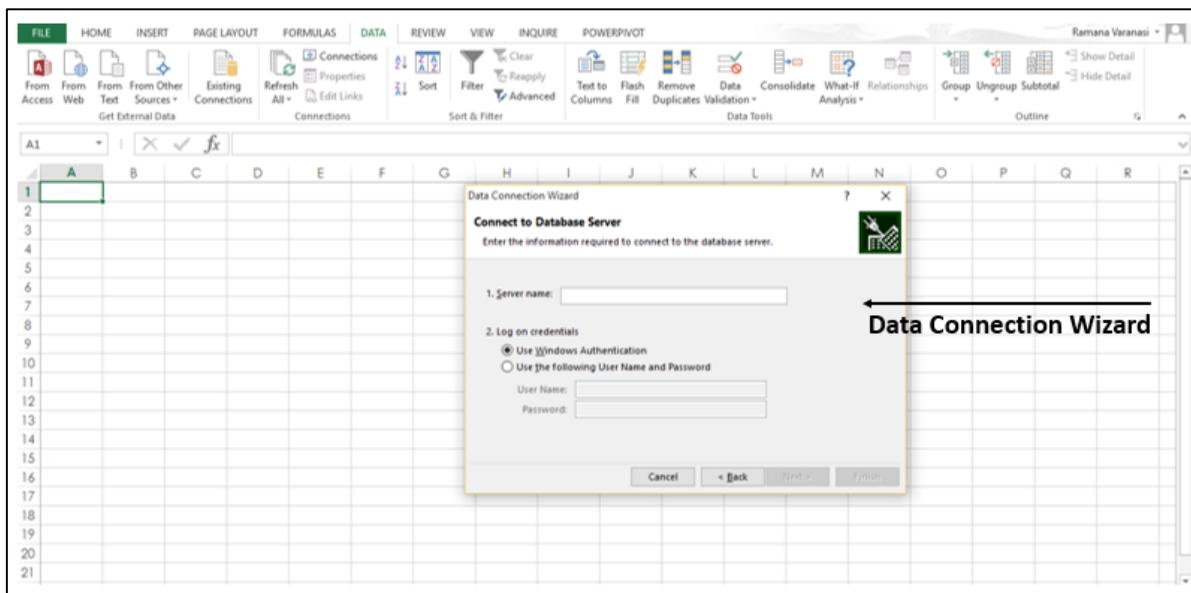
The options of **External Data Sources** appear as shown in the image below.



Step 3: Click the option **From SQL Server** to create a connection to an SQL Server table.



A **Data Connection Wizard** dialog box appears.



Step 4: Establish the connection in three steps given below.

1. Enter the **database server** and specify how you want to log on to the server.
2. Enter the **database, table**, or **query** that contains the data you want.
3. Enter the **connection file** you want to create.

Using the Field List option

In Excel 2013, it is possible to arrange the fields in a **PivotTable**.

Salesperson	Region	Account	Order Amount	Month
Albertson, Kathy	East	29386	\$925.00	January
Albertson, Kathy	East	74830	\$875.00	February
Albertson, Kathy	East	90099	\$500.00	February
Albertson, Kathy	East	74830	\$350.00	March
Brennan, Michael	West	82853	\$400.00	January
Brennan, Michael	West	72949	\$850.00	January
Brennan, Michael	West	90044	\$1,500.00	January
Brennan, Michael	West	82853	\$550.00	February
Brennan, Michael	West	72949	\$400.00	March
Davis, William	South	55223	\$235.00	February
Davis, William	South	10354	\$850.00	January
Davis, William	South	50192	\$600.00	March
Davis, William	South	27589	\$250.00	January
Dumiao, Richard	West	67275	\$400.00	January
Dumiao, Richard	West	41828	\$965.00	February
Dumiao, Richard	West	87543	\$125.00	March
Flores, Tia	South	97446	\$1,500.00	March
Flores, Tia	South	41400	\$305.00	January
Flores, Tia	South	30974	\$1,350.00	January
Flores, Tia	South	41400	\$435.00	February
Flores, Tia	South	30974	\$550.00	February

Step 1: Select the data table.

Step 2: Click the **Insert Tab**.

Step 3: Click on the **PivotTable** button. The **Create PivotTable** dialog box opens.

Step 4: Fill the data and then click **OK**. The PivotTable appears on a New Worksheet.

The screenshot shows the Microsoft Excel ribbon with the 'ANALYZE' tab selected. On the left, there's a PivotTable named 'PivotTable2'. The 'Fields' pane on the right lists fields: Salesperson, Region, Account, Order Amount, and Month. The 'Areas' pane shows the layout: FILTERS (under ROWS), ROWS, and VALUES. The main area shows the initial structure of the PivotTable.

Step 5: Choose the **PivotTable Fields** from the field list. The fields are added to the **default areas**.

The **Default areas** of the **Field List** are:

- Nonnumeric fields are added to the **Rows** area
- Numeric fields are added to the **Values** area, and
- Time hierarchies are added to the **Columns** area

The screenshot shows the Microsoft Excel ribbon with the 'ANALYZE' tab selected. The 'Fields' pane on the right shows fields: Salesperson, Region, Account, Order Amount, and Month. The 'ROWS' area in the 'Areas' pane contains 'Salesperson'. The 'VALUES' area contains 'Month'. The main area shows the PivotTable structure with data for Salesperson, Month, and Order Amount.

	Sum of Account	Sum of Order Amount
Albertson, Kathy	249145	2450
January	29386	925
February	164929	1375
March	74830	350
Brennan, Michael	401448	3700
January	245846	2750
February	82853	550
March	72949	400
Davis, William	143358	1935
January	37943	1100
February	55223	235
March	50192	600
Dumiao, Richard	196446	1490
January	67275	400
February	41828	965
March	87543	125
Flores, Tia	273168	4565
January	72374	1655

You can rearrange the fields in the PivotTable by dragging the fields in the areas.

Step 6: Drag **Region Field** from **Rows area** to **Filters area**. The **Filters area** fields are shown as top-level report filters above the PivotTable.

	A	B	C	D	E	F	G	H	I	J	K
1	Region	(All)									
2											
3	Row Labels		Sum of Account	Sum of Order Amount							
4	Albertson, Kathy	269145	2650								
5	January	29386	925								
6	February	164929	1375								
7	March	74830	350								
8	Brennan, Michael	401648	3700								
9	January	245846	2750								
10	February	82853	550								
11	March	72949	400								
12	Davis, William	143358	1935								
13	January	37943	1100								
14	February	55223	235								
15	March	50192	600								
16	Dumiao, Richard	176646	1490								
17	January	67275	400								
18	February	41828	965								
19	March	87543	125								
20	Flores, Tia	273168	4545								
21	January	72374	1655								

Step 7: The **Rows** area fields are shown as **Row Labels** on the left side of the PivotTable.

	A	B	C	D	E	F	G	H	I	J	K
1	Rows Labels										
2	Row Labels		Sum of Account	Sum of Order Amount							
3	Albertson, Kathy	269145	2650								
4	January	29386	925								
5	February	164929	1375								
6	March	74830	350								
7	Brennan, Michael	401648	3700								
8	January	245846	2750								
9	February	82853	550								
10	March	72949	400								
11	Davis, William	143358	1935								
12	January	37943	1100								
13	February	55223	235								
14	March	50192	600								
15	Dumiao, Richard	176646	1490								
16	January	67275	400								
17	February	41828	965								
18	March	87543	125								
19	Flores, Tia	273168	4545								
20	January	72374	1655								

The **order** in which the Fields are placed in the **Rows** area, defines the **hierarchy** of the Row Fields. Depending on the hierarchy of the fields, rows will be nested inside rows that are higher in position.

In the PivotTable above, **Month Field Rows** are nested inside **Salesperson Field Rows**. This is because in the **Rows** area, the field **Salesperson** appears first and the field **Month** appears next, defining the hierarchy.

Step 8: Drag the field- **Month** to the first position in the **Rows** area. You have changed the hierarchy, putting **Month** in the highest position. Now, in the PivotTable, the field - **Salesperson** will nest under **Month** fields.

The screenshot shows a Microsoft Excel spreadsheet with a PivotTable. The PivotTable Fields pane on the right indicates that Salesperson, Region, Account, Order Amount, and Month are chosen for the report. The Rows section of the PivotTable Fields pane shows Month and Salesperson. The Columns section shows Region. The Values section shows Sum of Account and Sum of Order Amount. The PivotTable itself displays data grouped by Month (January and February) and Salesperson, with regional and account details nested under each month. A callout box labeled "Salesperson Fields nested under Month Fields" points to the Salesperson column in the PivotTable. Another callout box labeled "Hierarchy of Row Fields changed" points to the Month field in the PivotTable Fields pane.

	Region	Sum of Account	Sum of Order Amount
January	Albertson, Kathy	29386	925
	Brennan, Michael	245846	2750
	Davis, William	37943	100
	Dumiao, Richard	67275	200
	Flores, Tia	72374	1655
	Post, Melissa	78532	765
	Thompson, Shannon	183028	1140
	Walters, Chris	150088	355
February	Albertson, Kathy	164929	1375
	Brennan, Michael	82853	550
	Davis, William	55223	235
	Dumiao, Richard	41828	965
	Flores, Tia	72374	985
	Post, Melissa	144064	575
	Thompson, Shannon	183028	1720
	Walters, Chris	110060	2755

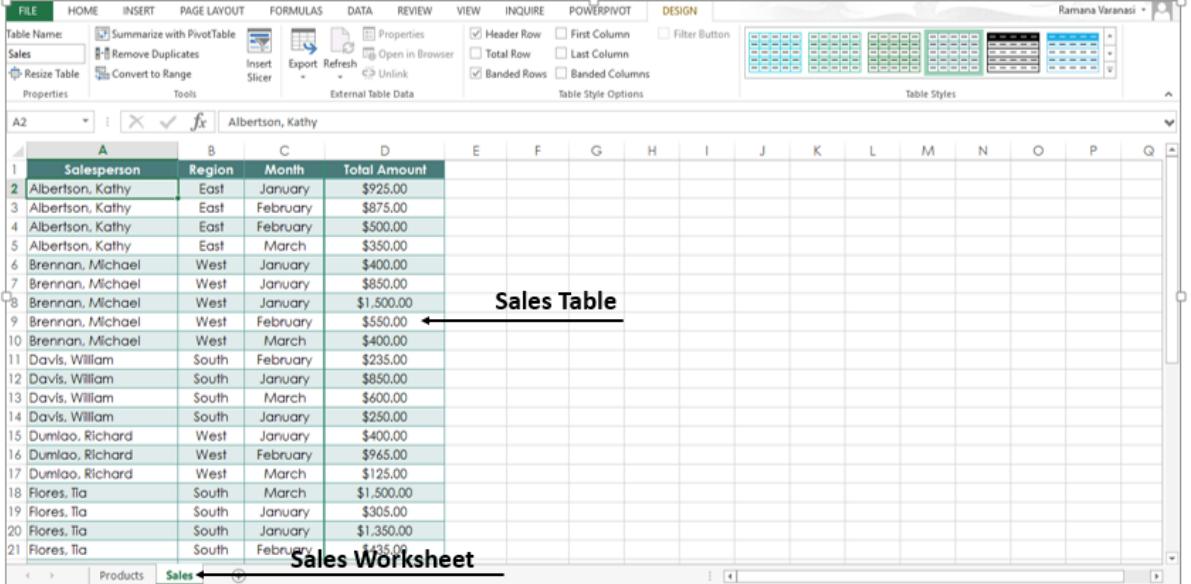
In a similar way, you can drag **Fields** in the **Columns** area also. The **Columns** area fields are shown as **Column Labels** at the **top** of the **PivotTable**.

The screenshot shows a Microsoft Excel spreadsheet with a PivotTable. The PivotTable Fields pane on the right indicates that Salesperson, Region, Account, Order Amount, and Month are chosen for the report. The Rows section of the PivotTable Fields pane shows Month and Salesperson. The Columns section shows Region. The Values section shows Sum of Account and Sum of Order Amount. The PivotTable itself displays data grouped by Salesperson, with regional and account details nested under each salesperson. A callout box labeled "Column Labels" points to the Region column in the PivotTable. Another callout box labeled "Column Fields" points to the Month field in the PivotTable Fields pane.

	Region	Sum of Account	Sum of Order Amount
Salesperson	(All)		
Albertson, Kathy	269145	2650	
Brennan, Michael	401648	3700	
Davis, William	143358	1935	
Dumiao, Richard	196646	1490	
Flores, Tia	273168	4565	
Post, Melissa	301128	1690	
Thompson, Shannon	458043	3160	
Walters, Chris	397797	4375	
Grand Total	2440933	23565	

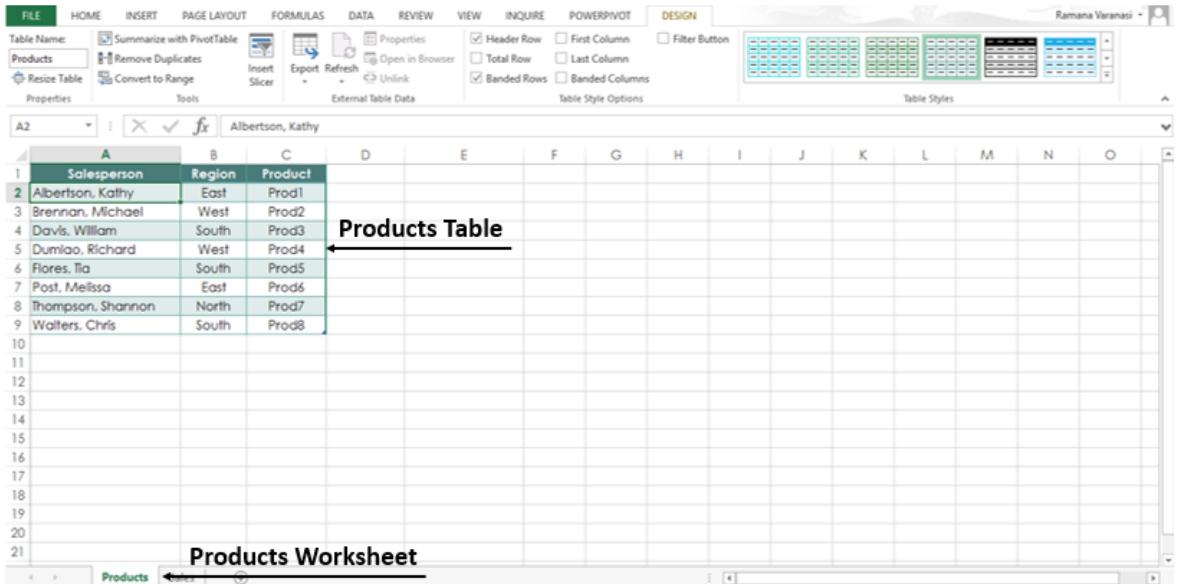
PivotTables based on Multiple Tables

In Excel 2013, it is possible to create a PivotTable from multiple tables. In this example, the table '**Sales**' is on one worksheet and table- '**Products**' is on another worksheet.



The screenshot shows the 'Sales' worksheet tab selected at the bottom. The 'Sales' table is displayed in the center of the screen, spanning columns A to D and rows 1 to 21. The table has headers: Salesperson, Region, Month, and Total Amount. Row 2 contains the first data entry. An arrow points to the cell containing '\$1,500.00' in row 8, column C, with the label 'Sales Table' next to it. The ribbon at the top shows the 'DESIGN' tab is active. The status bar at the bottom indicates the cell A2 is selected.

Salesperson	Region	Month	Total Amount
Albertson, Kathy	East	January	\$925.00
Albertson, Kathy	East	February	\$875.00
Albertson, Kathy	East	February	\$500.00
Albertson, Kathy	East	March	\$350.00
Brennan, Michael	West	January	\$400.00
Brennan, Michael	West	January	\$850.00
Brennan, Michael	West	January	\$1,500.00
Brennan, Michael	West	February	\$550.00
Brennan, Michael	West	March	\$400.00
Davis, William	South	February	\$235.00
Davis, William	South	January	\$850.00
Davis, William	South	March	\$600.00
Davis, William	South	January	\$250.00
Dumiao, Richard	West	January	\$400.00
Dumiao, Richard	West	February	\$965.00
Dumiao, Richard	West	March	\$125.00
Flores, Tia	South	March	\$1,500.00
Flores, Tia	South	January	\$305.00
Flores, Tia	South	January	\$1,350.00
Flores, Tia	South	February	\$435.00



The screenshot shows the 'Products' worksheet tab selected at the bottom. The 'Products' table is displayed in the center of the screen, spanning columns A to C and rows 1 to 21. The table has headers: Salesperson, Region, and Product. Row 2 contains the first data entry. An arrow points to the cell containing 'Prod1' in row 2, column C, with the label 'Products Table' next to it. The ribbon at the top shows the 'DESIGN' tab is active. The status bar at the bottom indicates the cell A2 is selected.

Salesperson	Region	Product
Albertson, Kathy	East	Prod1
Brennan, Michael	West	Prod2
Davis, William	South	Prod3
Dumiao, Richard	West	Prod4
Flores, Tia	South	Prod5
Post, Melissa	East	Prod6
Thompson, Shannon	North	Prod7
Walters, Chris	South	Prod8

Step 1: Select the **Sales** sheet from the worksheet tabs.

Step 2: Click the **Insert** tab.

Step 3: Click on the PivotTable button on the ribbon. The **Create PivotTable** dialog box,

Step 4: Select the sales table.

Step 5: Under "choose whether you want to analyze multiple tables", Click **Add this Data to the Data Model**.

Step 6: Click **OK**.

Insert tab

PivotTable

Create PivotTable Dialog Box

Table Selected

Analysis of Multiple Tables Selected

Salesperson	Region	Month	Total Amount
Albertson, Kathy	East	January	\$925.00
Albertson, Kathy	East	February	\$875.00
Albertson, Kathy	East	March	\$500.00
Albertson, Kathy	East	March	\$350.00
Brennan, Michael	West	January	\$400.00
Brennan, Michael	West	January	\$850.00
Brennan, Michael	West	January	\$1,500.00
Brennan, Michael	West	February	\$550.00
Brennan, Michael	West	March	\$400.00
Davis, William	South	February	\$235.00
Davis, William	South	January	\$850.00
Davis, William	South	March	\$600.00
Davis, William	South	January	\$250.00
Dumiao, Richard	West	January	\$400.00
Dumiao, Richard	West	February	\$965.00
Dumiao, Richard	West	March	\$125.00
Flores, Tia	South	March	\$1,500.00
Flores, Tia	South	January	\$305.00
Flores, Tia	South	January	\$1,350.00
Flores, Tia	South	February	\$435.00
Flores, Tia	South	February	\$550.00

Under the **PivotTable Fields**, you will see the options, **ACTIVE** and **ALL**.

Step 7: Click on **ALL**. You will see both the tables and the fields in both the tables.

Step 8: Select the fields to add to the PivotTable. You will see a message, “**Relationships between tables may be needed**”.

PivotTable Fields

ACTIVE | ALL

Message to create Relationships

Row Labels	Sum of Total Amount
Albertson, Kathy	23565
East	23565
Prod1	23565
Albertson, Kathy	2650
East	2650
February	1375
January	925
March	350
Brennan, Michael	3700
West	3700
February	550
January	2750
March	400
Davis, William	1935
South	1935
February	235
January	1100
March	600

Step 9: Click on the **CREATE** button. After a few steps for creation of Relationship, the selected fields from the two tables are added to the PivotTable.

The screenshot shows a Microsoft Excel spreadsheet with a PivotTable. The PivotTable Fields pane on the right lists fields selected from two tables: 'Products' and 'Sales'. The 'Products' table includes Salesperson, Region, Month, and Total Amount. The 'Sales' table includes Salesperson, Region, Month, and Total Amount. The main area shows a PivotTable with data for Salesperson (Albertson, Kathy; Brennan, Michael; Davis, William; Dumiao, Richard) across Regions (East, West) and Months (February, January, March). The data is summarized by summing the Total Amount.

Row Labels		Sum of Total Amount									
Albertson, Kathy	East	2650									
	February	1375									
	January	925									
	March	350									
Brennan, Michael	West	3700									
	February	550									
	January	2750									
	March	400									
Davis, William	South	1935									
	February	235									
	January	1100									
	March	600									
Dumiao, Richard	West	1490									
	February	965									

PivotTable with Data from Two Tables

Fields selected from two Tables

Part 4: Powerful Data Analysis – 1

12. Excel – Data Model in Excel

Excel 2013 has powerful data analysis features. You can build a data model, then create amazing interactive reports using Power View. You can also make use of the Microsoft Business Intelligence features and capabilities in Excel, PivotTables, Power Pivot, and Power View.

Data Model is used for building a model where data from various sources can be combined by creating relationships among the data sources. A Data Model integrates the tables, enabling extensive analysis using PivotTables, Power Pivot, and Power View.

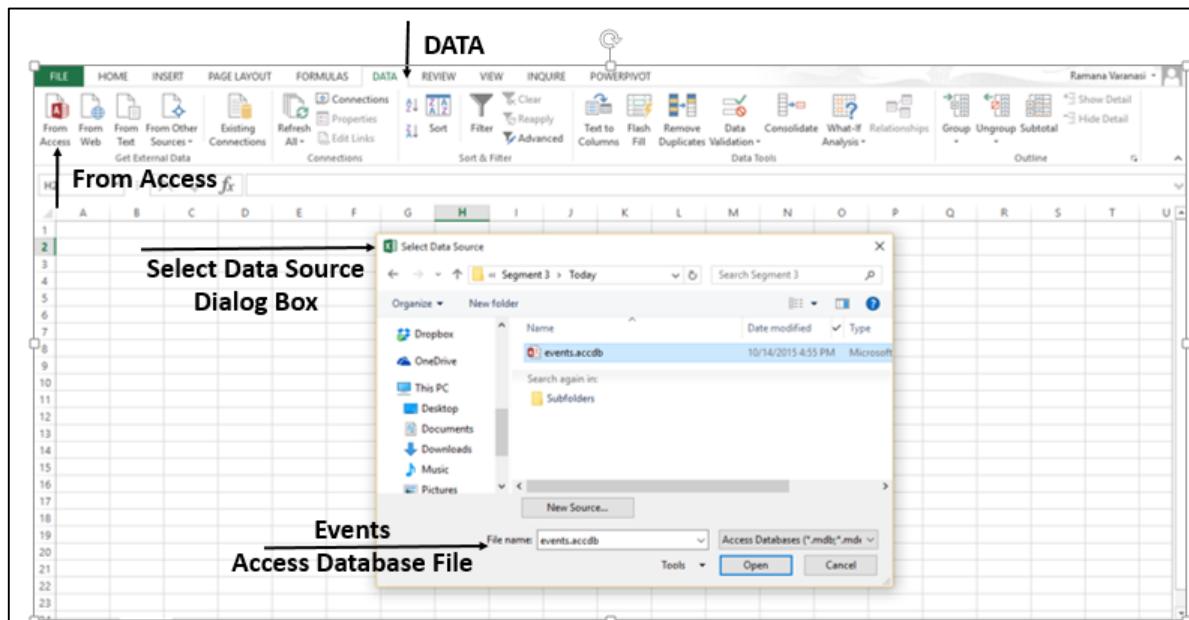
A **Data Model** is created automatically when you import two or more tables simultaneously from a database. The existing database relationships between those tables is used to create the Data Model in Excel.

Step 1: Open a new blank Workbook in Excel.

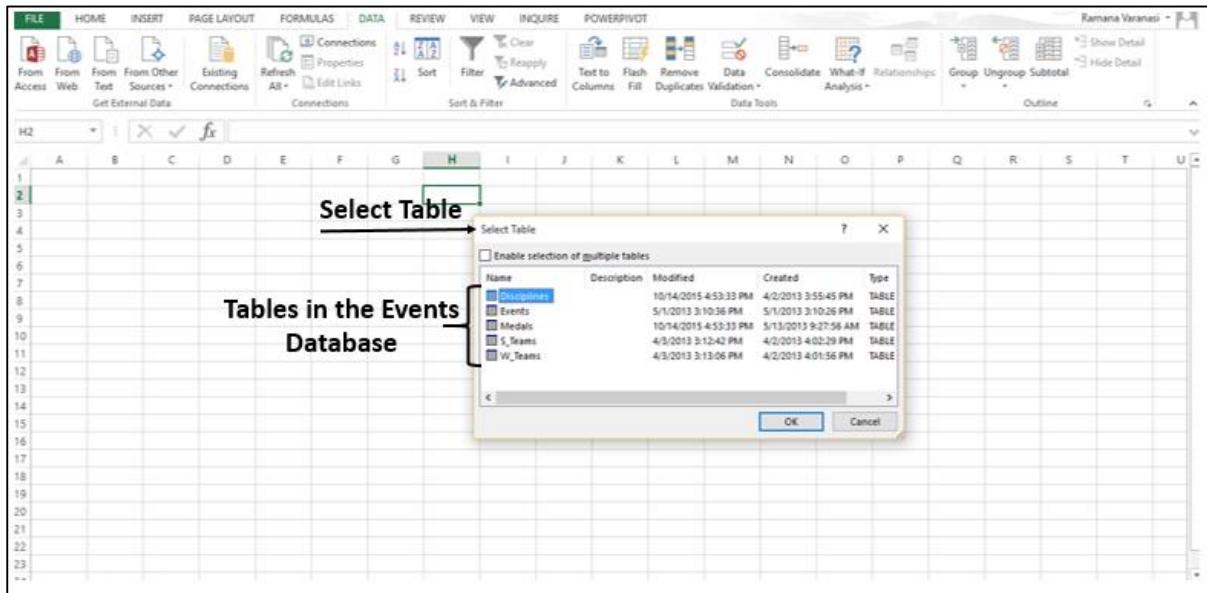
Step 2: Click on the **DATA** tab .

Step 3: In the **Get External Data** group, click on the option **From Access**. The **Select Data Source** dialog box opens.

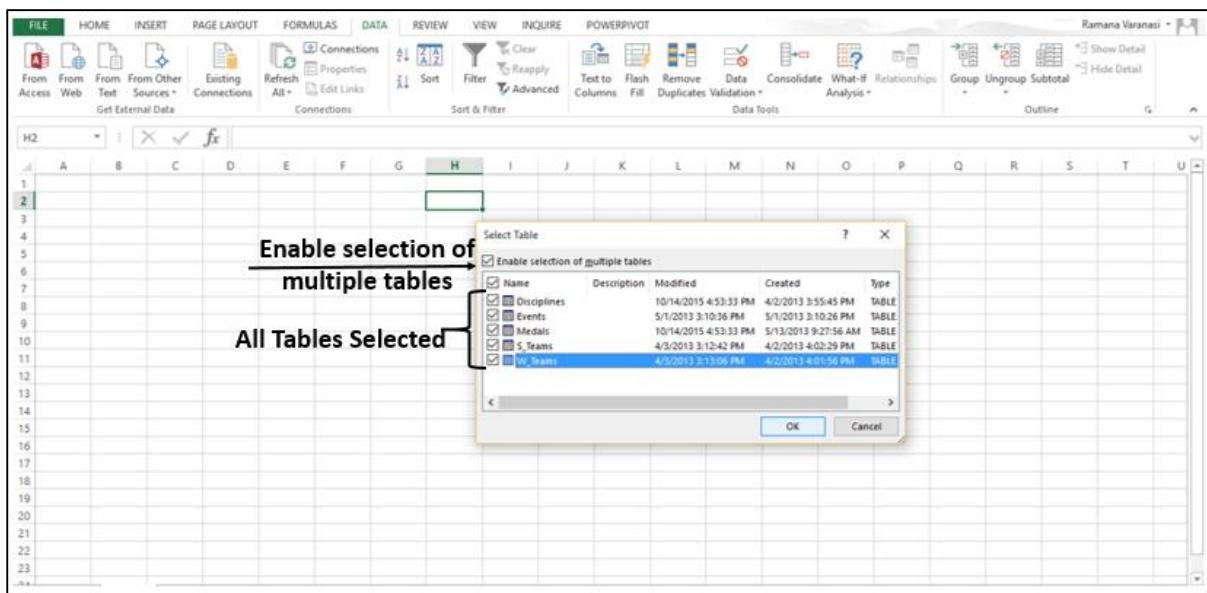
Step 4: Select **Events.accdb**, Events Access Database file.



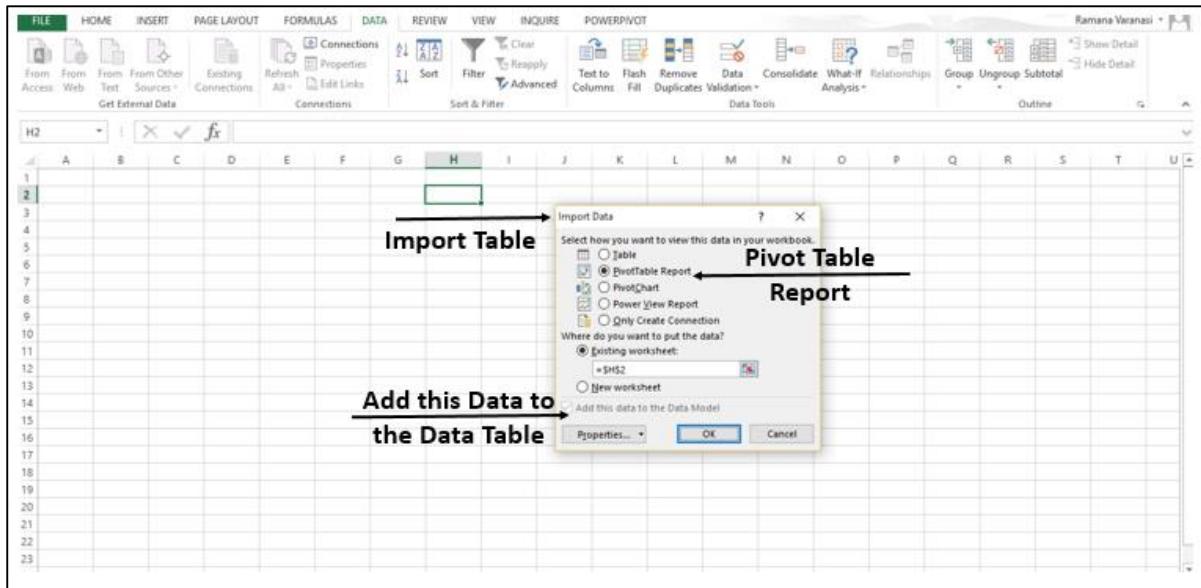
Step 5: The **Select Table** window, displaying all the **tables** found in the database, appears.



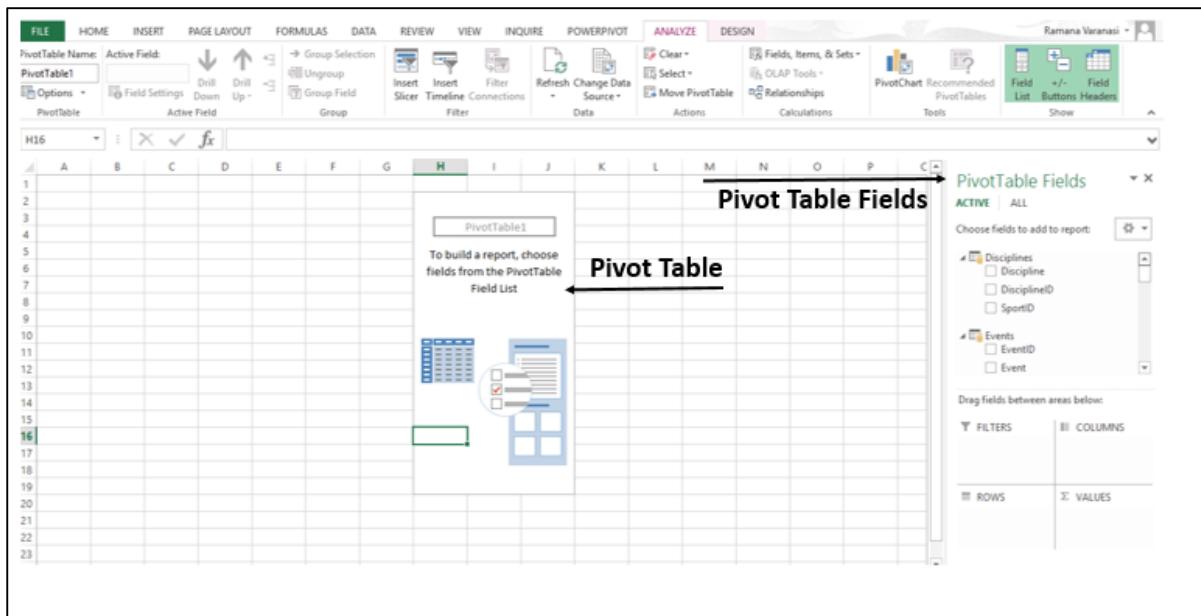
Step 6: Tables in a database are similar to the tables in Excel. Check the '**Enable selection of multiple tables**' box, and select all the tables. Then click **OK**.



Step 7: The **Import Data** window appears. Select the **PivotTable Report** option. This option imports the tables into Excel and prepares a PivotTable for analyzing the imported tables. Notice that the checkbox at the bottom of the window- '**Add this data to the Data Model**' is selected and disabled.



Step 8: The data is imported, and a **PivotTable** is created using the imported tables.



You have imported the data into Excel and the **Data Model** is created automatically. Now, you can explore data in the five tables, which have relationships defined among them.

Explore Data Using PivotTable

Step 1: You know how to add fields to PivotTable and drag fields across areas. Even if you are not sure of the final report that you want, you can play with the data and choose the best-suited report.

In **PivotTable Fields**, click on the arrow beside the table- **Medals** to expand it to show the fields in that table. Drag the **NOC_CountryRegion** field in the **Medals** table to the **COLUMNS** area.

Step 2: Drag **Discipline** from the **Disciplines** table to the **ROWS** area.

Step 3: Filter **Discipline** to display only five sports: Archery, Diving, Fencing, Figure Skating, and Speed Skating. This can be done either in **PivotTable Fields** area, or from the **Row Labels** filter in the PivotTable itself.

Step 4: In **PivotTable Fields**, from the **Medals** table, drag Medal to the **VALUES** area.

Step 5: From the **Medals** table, select **Medal** again and drag it into the **FILTERS** area.

	ARG	AUS	AUT	BEL	BLR	BOH	BUL	CAN	CHN	CUB	DEN	EGY	ESP	EUA	EUN	FIN	FRA	FRG	GBR	GDR	GER	GRE	HUN	INA	ITA	JPN	KAZ	KOR	MEX	NED	NOR	POL	PRK	ROU	RUI	SWE	TUR	UNG	URY	VEN	YUG	ZAF
5	Archery	2	51					15		3	4	6	46		13	6							3	12	3	52	9	4														
6	Diving		17					11	60	2	2	4	3	1	7	7	24	2					9																			
7	Fencing	5	13	44	5			19	24	5	1	10	13	283	47	24	1	51	226	328	1	3	1	24	81	39																
8	Figure skating		25	3				28	7		5	9	4	18	3	19	13	11	12	2	2		3	7																		
9	Speed skating	1	6	1	1			3	43	19	2	1	24	3	1	29	34		7	15	1	18	75	79	2	2																
10	Grand Total	5	20	44	99	1	5	3	82	120	24	7	2	4	21	30	34	348	53	64	50	126	2	238	3	358	21	1	73	12	111	86	87	2	39	1						

Step 6: Click the dropdown list button to the right of the **Column** labels.

Step 7: Select **Value Filters** and then select **Greater Than...**

Step 8: Click **OK**.

The screenshot shows a Microsoft Excel spreadsheet titled "Data Model.xlsx - Excel". The PivotTable is set up to show the count of medals by country. A dropdown menu is open over the cell B3, labeled "Count of Medal [Column Labels]". The "Value Filters" option is selected, opening a dialog box titled "Value Filter (NOC_CountryRegion)". The filter condition "is greater than" is selected, and the value "80" is typed into the input field. Other filter options like "Greater Than Or Equal To..." and "Less Than..." are also visible.

The **Value Filters** dialog box for the count of Medals **is greater than** appears.

Step 9: Type **80** in the **Right Field**.

Step 10: Click **OK**.

This screenshot shows the same Excel environment after Step 10. The "Value Filter (NOC_CountryRegion)" dialog box is still open, but the input field now contains "80" instead of "80". The "OK" button is highlighted with a large arrow pointing towards it. The main PivotTable has been filtered to show only countries where the count of medals is greater than 80.

The PivotTable displays only those regions, which has more than total 80 medals.

Medal	All	CAN	CHN	FRA	GER	HUN	ITA	NED	NOR	POL	RUS	URS	USA	Grand Total
Archery		51	15	46	6	12	9	4	1	7	52		203	
Diving		11	60	1	24		9			24	14	131	274	
Fencing		44	19	283	51	226	328	24		81	41	145	48	
Figure skating		3	28	7	18	11	12	2	3	7	29	42	51	
Speed skating		1	43	19	34		7	75	79	2	8	60	73	
Grand Total		99	82	120	348	126	238	358	111	86	87	103	268	355

You could analyze your data from the different tables and arrive at the specific report you want in just a few steps. This was possible because of the pre-existing relationships among the tables in the source database. As you imported all the tables from the database together at the same time, Excel recreated the relationships in its Data Model.

If you do not import the tables at the same time, or if the data is from different sources or if you add new tables to your Workbook, you have to create the **Relationships** among the **Tables** by yourself.

Create Relationship between Tables

Relationships let you analyze your collections of the data in Excel, and create interesting and aesthetic reports from the data you import.

Step 1: Insert a new Worksheet.

Step 2: Create a new table with new data. Name the new table as **Sports**.

The screenshot shows a Microsoft Excel interface with the following details:

- Sheet1:** Contains a table titled "Aquatics" with columns "Sport" and "SportID". The data includes various sports like Aquatics, Archery, Athletics, Badminton, Baseball, Basketball, Basque Pelota, Biathlon, Bobsleigh, Boxing, Canoe / Kayak, Cricket, Croquet, Curling, Cycling, Equestrian, Fencing, Football, Golf, Gymnastics, Handball, and Hockey, each assigned a unique SportID.
- Sheet2:** A blank worksheet tab.
- Excel ribbon:** The DESIGN tab is selected. Other tabs include FILE, HOME, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, INQUIRE, POWERPIVOT, and DESIGN.
- Toolbars and Buttons:** Standard Excel toolbars for Cut, Copy, Paste, Font, Alignment, Number, Styles, and Cells are visible.
- Text Labels:** "New Data Table" is positioned above the table in Sheet1, and "New Worksheet" is positioned above the Sheet2 tab.

Step 3: Now you can create relationship between this new table and the other tables that already exist in the **Data Model** in Excel. Rename the Sheet1 as **Medals** and Sheet2 as **Sports**.

On the **Medals sheet**, in the **PivotTable Fields List**, click **All**. A complete list of available tables will be displayed. The newly added table- **Sports** will also be displayed.

The screenshot shows a Microsoft Excel interface with the following details:

- PivotTable Report:** Titled "Table - Sports". The report displays the "Count of Medal" for various sports across different countries. The data includes Archery, Diving, Fencing, Figure skating, Speed skating, and a Grand Total.
- PivotTable Fields List:** The "ALLs" pane is open, showing the following fields:
 - ACTIVE:** ALL
 - Choose fields to add to report:**
 - Disciplines
 - Medals
 - Events
 - S_Teams
 - Sports
- Filters and Columns:**
 - FILTERS:** Medal
 - COLUMNS:** NOC_Country
 - ROWS:** Discipline
 - VALUES:** Count of Medal
- Excel ribbon:** The ANALYZE tab is selected. Other tabs include FILE, HOME, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, INQUIRE, POWERPIVOT, and DESIGN.
- Toolbars and Buttons:** Standard Excel toolbars for Cut, Copy, Paste, Font, Alignment, Number, Styles, and Cells are visible.

Step 4: Click on **Sports**. In the expanded list of fields, select **Sports**. Excel messages you to create a relationship between tables.

The screenshot shows a Microsoft Excel interface with a PivotTable Fields pane open on the right. The 'ACTIVE' tab is selected. A callout bubble points to the 'CREATE...' button in the 'Relationships' section of the pane, with the text 'Message to Create Relationships Between Tables'. The PivotTable itself displays medal counts by sport.

Step 5: Click on **CREATE**. The **Create Relationship** dialog box opens.

The screenshot shows the 'Create Relationship' dialog box in the foreground, with a callout bubble pointing to the 'CREATE...' button in the 'Relationships between tables may be needed' section. The background shows the same Excel interface as the previous screenshot, with the PivotTable Fields pane still visible.

Step 6: To create the relationship, one of the tables must have a column of unique, non-repeated, values. In the **Disciplines** table, **SportID** column has such values. The table **Sports** that we have created also has the **SportID** column. In **Table**, select **Disciplines**.

Step 7: In **Column (Foreign)**, select SportID.

Step 8: In **Related Table**, select **Sports**.

Step 9: In **Related Column (Primary)**, SportID gets selected automatically. Click **OK**.

Step 10: The **PivotTable** is modified to reflect the addition of the new **Data Field** Sport. Adjust the order of the fields in the Rows area to maintain the **Hierarchy**. In this case, **Sport** should be first and **Discipline** should be the next, as **Discipline** will be nested in Sport as a sub-category.

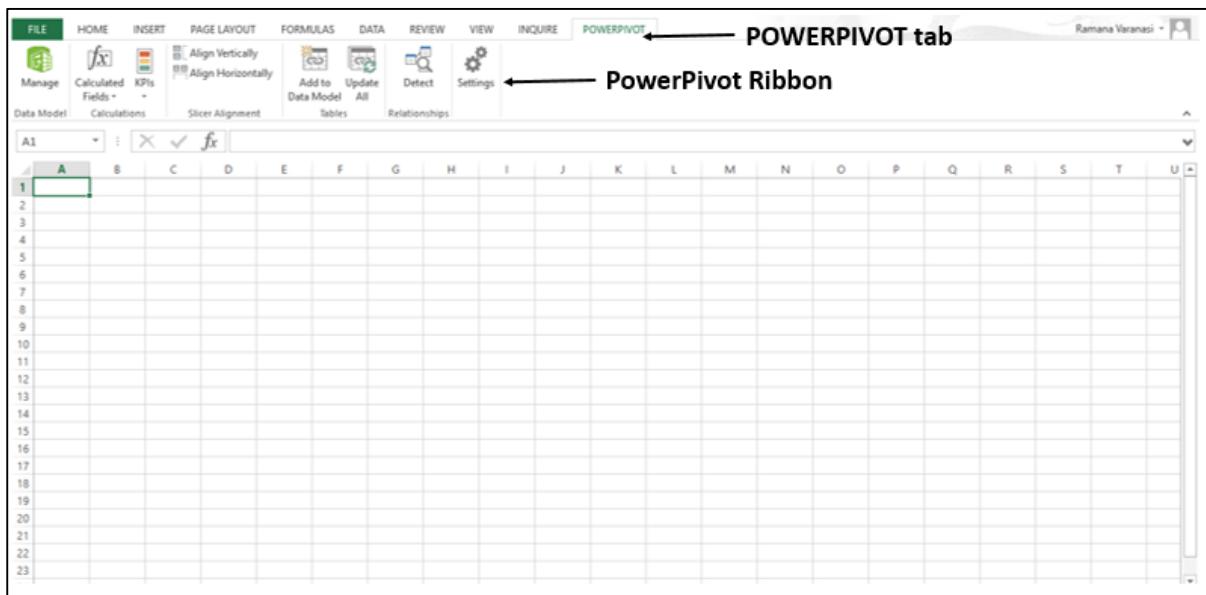
The screenshot shows a Microsoft Excel spreadsheet with a PivotTable. The PivotTable has 'Sport' in the Row Labels and 'Discipline' in the Column Labels. The data includes medal counts for various countries across different sports and disciplines. A handwritten note 'PivotTable with the New Relationship' is overlaid on the right side of the PivotTable area. Another handwritten note 'Rows ordered for proper Hierarchy' is overlaid below the PivotTable. The PivotTable Fields pane on the right shows the fields used in the report, including 'Sports' and 'Disciplines'. The PivotTable is located in the range A3:Z43.

Sport	Discipline	Medals										Grand Total		
		CAN	CHN	FRA	GER	HUN	ITA	NED	NOR	POL	RUS		URS	USA
Aquatics		11	60	1	24	9		24	14	131		274		
Diving		11	60	1	24	9		24	14	131		274		
Archery		51	15	46	6	12	9	4	1	7	52	203		
Archery		51	15	46	6	12	9	4	1	7	52	203		
Fencing		44	19	283	51	226	328	24	81	41	145	48	1290	
Fencing		44	19	283	51	226	328	24	81	41	145	48	1290	
Skating		4	71	26	18	45	12	9	78	86	2	37	102	124
Figure skating		3	28	7	18	11	12	2	3	7		29	42	51
Speed skating		1	43	19	34	7	75	79	2	8	60	73		401
Grand Total		99	82	120	348	126	238	358	111	86	87	103	268	355
														2381

13. Excel – Power Pivot

PowerPivot is an easy to use data analysis tool that can be used from within Excel. You can use **PowerPivot** to access and mashup data from virtually any source. You can create your own compelling reports and analytical applications, easily share insights, and collaborate with colleagues through Microsoft Excel and SharePoint.

Using PowerPivot, you can import data, create relationships, create calculated columns and measures, and add PivotTables, slicers and Pivot Charts.



Step 1: You can use **Diagram View** in PowerPivot to create a relationship. To start, get some more data into your workbook. You can copy and paste data from a Web Page also. Insert a new Worksheet.

Step 2: Copy data from the web page and paste it on the Worksheet.

Step 3: Create a table with the data. Name the table Hosts and rename the Worksheet Hosts.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	City	NOC_CountryRegion	Alpha-2 Code	Edition	Season													
2	Melbourne / Stockholm	AUS	AS	1956	Summer													
3	Sydney	AUS	AS	2000	Summer													
4	Innsbruck	AUT	AT	1964	Winter													
5	Innsbruck	AUT	AT	1976	Winter													
6	Antwerp	BEL	BE	1920	Summer													
7	Antwerp	BEL	BE	1920	Winter													
8	Montreal	CAN	CA	1976	Summer													
9	Lake Placid	CAN	CA	1980	Winter													
10	Calgary	CAN	CA	1988	Winter													
11	St. Moritz	SUI	SZ	1928	Winter													
12	St. Moritz	SUI	SZ	1948	Winter													
13	Beijing	CHN	CH	2008	Summer													
14	Berlin	GER	GM	1936	Summer													
15	Garmisch-Partenkirchen	GER	GM	1936	Winter													
16	Barcelona	ESP	SP	1992	Summer													
17	Helsinki	FIN	FI	1952	Summer													
18	Paris	FRA	FR	1900	Summer													
19	Paris	FRA	FR	1924	Summer													
20	Chamonix	FRA	FR	1924	Winter													
21	Grenoble	FRA	FR	1968	Winter													
22	Albertville	FRA	FR	1992	Winter													
23	London	GBR	GB	1908	Summer													

Step 4: Click on the **Worksheet** Hosts. Click the **POWERPIVOT** tab on the Ribbon.

Step 5: In the **Tables** group, click on **Add to Data Model**.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	City	NOC_CountryRegion	Alpha-2 Code	Edition	Season													
2	Melbourne / Stockholm	AUS	AS	1956	Summer													
3	Sydney	AUS	AS	2000	Summer													
4	Innsbruck	AUT	AT	1964	Winter													
5	Innsbruck	AUT	AT	1976	Winter													
6	Antwerp	BEL	BE	1920	Summer													
7	Antwerp	BEL	BE	1920	Winter													
8	Montreal	CAN	CA	1976	Summer													
9	Lake Placid	CAN	CA	1980	Winter													
10	Calgary	CAN	CA	1988	Winter													
11	St. Moritz	SUI	SZ	1928	Winter													
12	St. Moritz	SUI	SZ	1948	Winter													
13	Beijing	CHN	CH	2008	Summer													
14	Berlin	GER	GM	1936	Summer													
15	Garmisch-Partenkirchen	GER	GM	1936	Winter													
16	Barcelona	ESP	SP	1992	Summer													
17	Helsinki	FIN	FI	1952	Summer													
18	Paris	FRA	FR	1900	Summer													
19	Paris	FRA	FR	1924	Summer													
20	Chamonix	FRA	FR	1924	Winter													
21	Grenoble	FRA	FR	1968	Winter													
22	Albertville	FRA	FR	1992	Winter													
23	London	GBR	GB	1908	Summer													

Hosts Table gets added to the Data Model in the Workbook. The **PowerPivot** window opens.

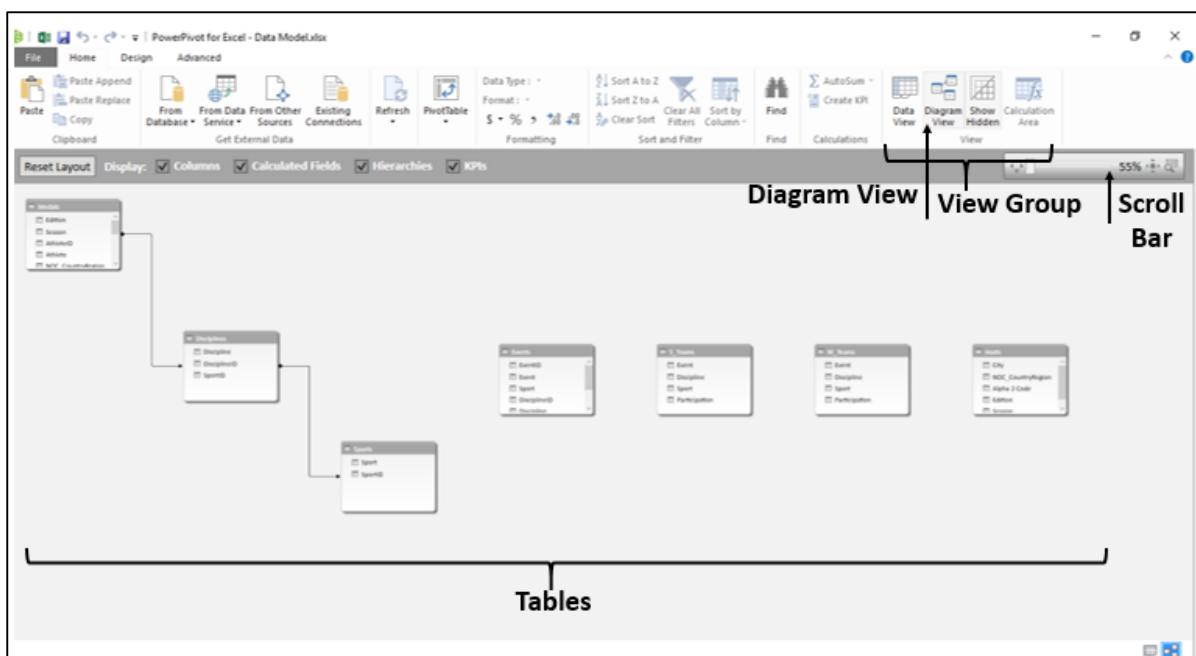
You will find all the Tables in the **Data Model** in the PowerPivot, though some of them are not present in the Worksheets in the Workbook.

All Tables in the Data Model

Disciplines Events Medals S_Teams W_Teams Sports Hosts

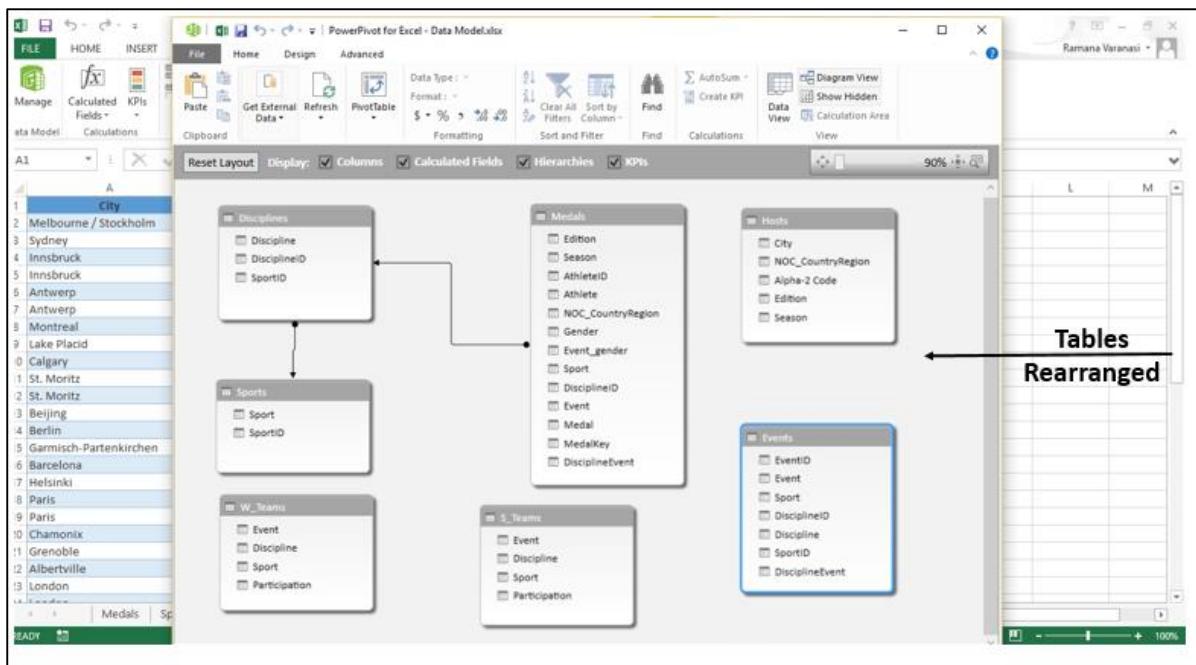
Step 6: In PowerPivot window, in **View** group, click on **Diagram View**.

Step 7: Use the slide bar to resize the diagram so that you can see all tables in the diagram.



Step 8: Rearrange the tables by dragging their title bar, so that they are visible and positioned next to one another.

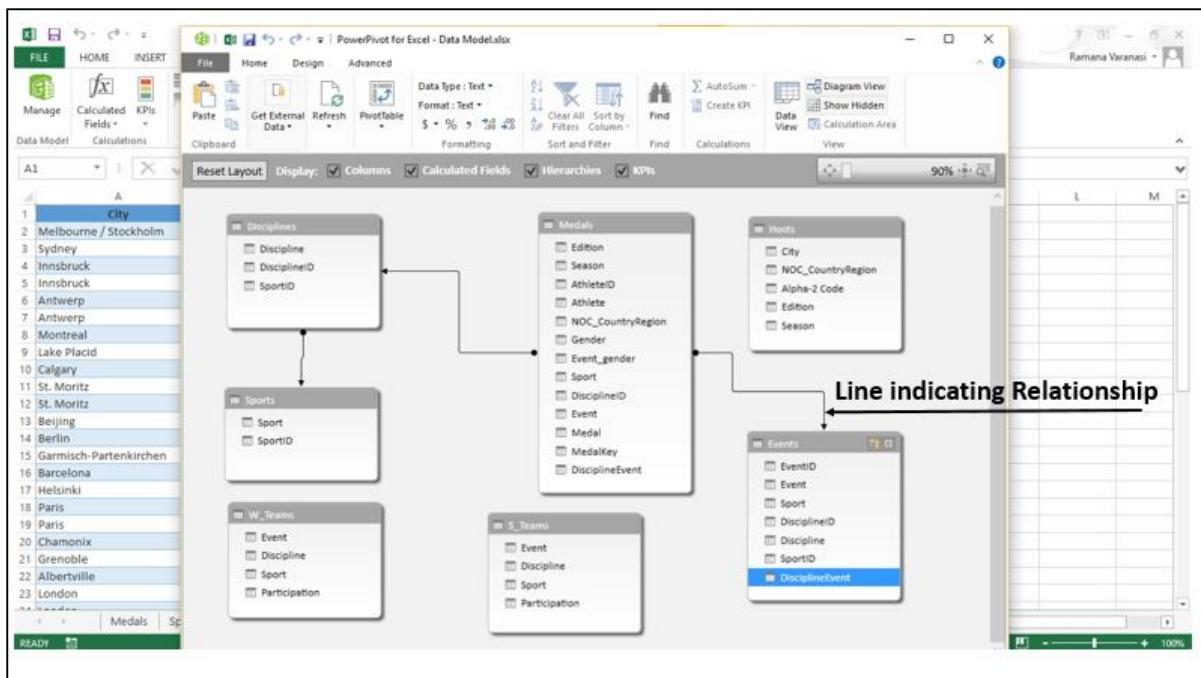
Four tables **Hosts**, **Events**, **W_Teams**, and **S_Teams** are unrelated to the rest of the tables:



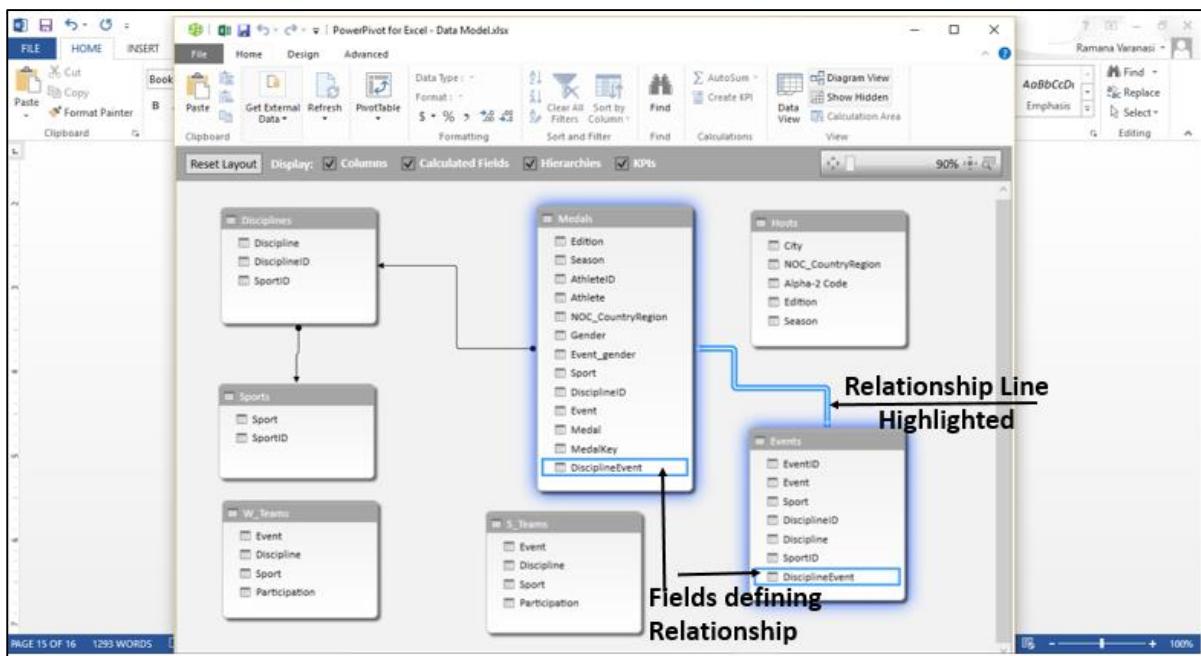
Step 9: Both, the **Medals** table and the **Events** table have a field called **DisciplineEvent**. Also, **DisciplineEvent** column in the **Events** table consists of unique, non-repeated values. Click on **Data View** in **Views Group**. Check **DisciplineEvent** column in the **Events** table.

EventID	Event	Sport	DisciplineID	Discipline	SportID	DisciplineEvent
E2	-47.6kg ...	Wrestling	D69	Wrestling Fc...	S47	D69-47.6kg (light...)
E4	-48kg	Wrestling	D69	Wrestling Fc...	S47	D69-48kg
E7	-48kg (l...	Wrestling	D69	Wrestling Fc...	S47	D69-48kg (light-f...
E13	-52kg (l...	Wrestling	D69	Wrestling Fc...	S47	D69-52kg (flywe...
E16	-54kg (...	Wrestling	D69	Wrestling Fc...	S47	D69-54kg (banta...
E18	-55kg	Wrestling	D69	Wrestling Fc...	S47	D69-55kg
E20	-56kg (...	Wrestling	D69	Wrestling Fc...	S47	D69-56kg (banta...
E26	-60kg (f...	Wrestling	D69	Wrestling Fc...	S47	D69-60kg (feath...
E35	+100kg ...	Wrestling	D69	Wrestling Fc...	S47	D69+100kg (super...
E42	+71.67kg ...	Wrestling	D69	Wrestling Fc...	S47	D69+71.67kg (heav...
E44	+73kg (...	Wrestling	D69	Wrestling Fc...	S47	D69+73kg (heavy...
E51	+80kg (...	Wrestling	D69	Wrestling Fc...	S47	D69+80kg (heavy...
E53	+82.5kg...	Wrestling	D69	Wrestling Fc...	S47	D69+82.5kg (super...
E58	+87kg (...	Wrestling	D69	Wrestling Fc...	S47	D69+87kg (heavy...
E65	+97kg (...	Wrestling	D69	Wrestling Fc...	S47	D69+97kg (heavy...
E73	100 - 13...	Wrestling	D69	Wrestling Fc...	S47	D69100 - 130kg (s...
E190	47.6 - 52...	Wrestling	D69	Wrestling Fc...	S47	D6947.6 - 52.16kg ...
E194	48 - 52kg...	Wrestling	D69	Wrestling Fc...	S47	D6948 - 52kg (flyw...
E197	48 - 54kg	Wrestling	D69	Wrestling Fc...	S47	D6948 - 54kg

Step 10: Once again, click on **Diagram View**. Click on the field Discipline Event in the Events table and drag it to the field **DisciplineEvent** in the Medals Table. A line appears between the Events Table and the Medals Table, indicating a **relationship** has been established.



Step 11: Click on the line. The line and the fields defining the relationship between the two tables are highlighted as shown in the image given below.

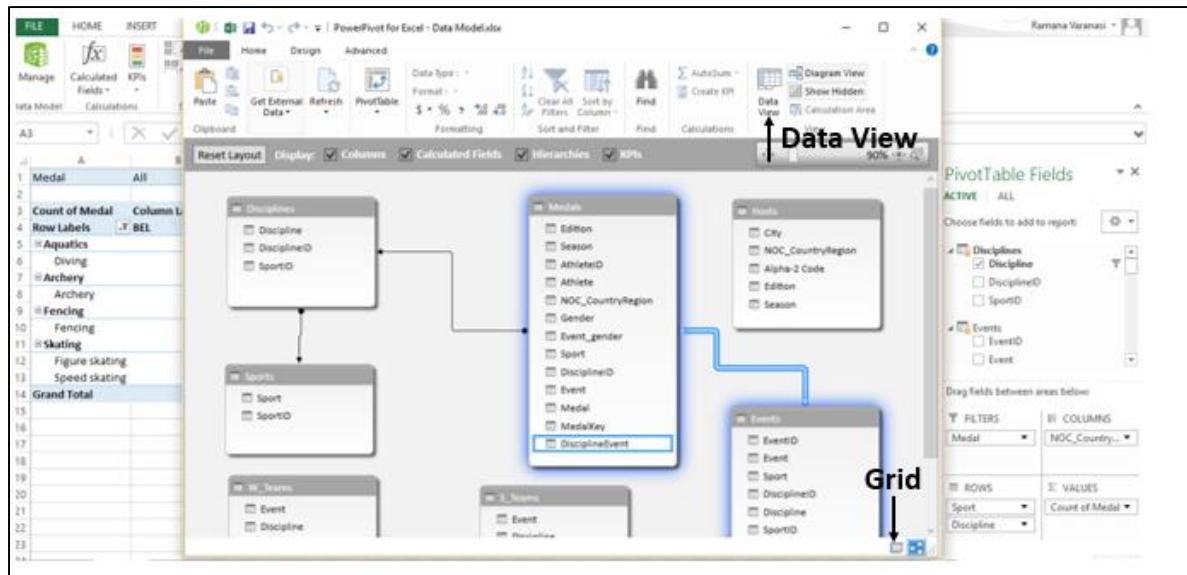


Data Model using Calculated Columns

Hosts table is still not connected to any of the other Tables. To do so, a field with values that uniquely identify each row in the **Hosts** table is to be found first. Then, search the **Data Model** to see if that same data exists in another table. This can be done in **Data View**.

Step 1: Shift to **Data View**. There are two ways of doing this.

- Click on **Data View** in the **View** group.
- Click on the **Grid** button on **Task Bar**.



The **Data View** appears.

Step 2: Click on the **Hosts** table.

Step 3: Check the data in Hosts Table to see if there is a field with unique values.

There is no such field in Hosts Table. You cannot edit or delete existing data using **PowerPivot**. However, you can create new columns by using **calculated fields** based on the existing data. In PowerPivot, you can use **Data Analysis Expressions (DAX)** to create calculations.

Adjacent to the existing columns is an empty column titled **Add Column**. PowerPivot provides that column as a placeholder.

City	NOC_CountryRegion	Alpha-2 Code	Edition	Season	Add Column
Innsbr...	AUT	AT	1964	Winter	
Innsbr...	AUT	AT	1976	Winter	
Antw...	BEL	BE	1920	Summer	
Antw...	BEL	BE	1920	Winter	
Montz...	CAN	CA	1976	Summer	
Lake Pl...	CAN	CA	1980	Winter	
Calgary	CAN	CA	1988	Winter	
St. Mo...	SUI	SZ	1928	Winter	
St. Mo...	SUI	SZ	1948	Winter	
Beijing	CHN	CH	2008	Summer	
Berlin	GER	GM	1936	Summer	
Garmi...	GER	GM	1936	Winter	
Barcel...	ESP	SP	1992	Summer	
Helsinki	FIN	FI	1952	Summer	
Paris	FRA	FR	1900	Summer	

Step 4: In the formula bar, type the DAX formula:

=CONCATENATE([Edition],[Season])

Press **Enter**. The **Add Column** is filled with values. Check the values to verify that they are unique across the rows.

	City	NOC_CountryRegion	Alpha-2 Code	Edition	Season	Add Column
1	Melb...	AUS	AS	1956	Summer	1956Summer
2	Sydney	AUS	AS	2000	Summer	2000Summer
3	Innsbr...	AUT	AT	1964	Winter	1964Winter
4	Innsbr...	AUT	AT	1976	Winter	1976Winter
5	Antw...	BEL	BE	1920	Summer	1920Summer
6	Antw...	BEL	BE	1920	Winter	1920Winter
7	Montr...	CAN	CA	1976	Summer	1976Summer
8	Lake P...	CAN	CA	1980	Winter	1980Winter
9	Calgary	CAN	CA	1988	Winter	1988Winter
10	St. Mo...	SUI	SZ	1928	Winter	1928Winter
11	St. Mo...	SUI	SZ	1948	Winter	1948Winter
12	Beijing	CHN	CH	2008	Summer	2008Summer
13	Berlin	GER	GM	1936	Summer	1936Summer
14	Garmi...	GER	GM	1936	Winter	1936Winter
15	Barcel...	ESP	SP	1992	Summer	1992Summer

Step 5: The newly created column with created values is named **CreatedColumn1**. To change the name of the column, select the column, right-click on it.

Step 6: Click on the option **Rename Column**.

	City	NOC_CountryRegion	Alpha-2 Code	Edition	Season	CalculatedColumn1
1	Melb...	AUS	AS	1956	Summer	1956Summer
2	Sydney	AUS	AS	2000	Summer	2000Summer
3	Innsbr...	AUT	AT	1964	Winter	1964Winter
4	Innsbr...	AUT	AT	1976	Winter	1976Winter
5	Antw...	BEL	BE	1920	Summer	1920Summer
6	Antw...	BEL	BE	1920	Winter	1920Winter
7	Montr...	CAN	CA	1976	Summer	1976Summer
8	Lake P...	CAN	CA	1980	Winter	1980Winter
9	Calgary	CAN	CA	1988	Winter	1988Winter
10	St. Mo...	SUI	SZ	1928	Winter	1928Winter
11	St. Mo...	SUI	SZ	1948	Winter	1948Winter
12	Beijing	CHN	CH	2008	Summer	2008Summer
13	Berlin	GER	GM	1936	Summer	1936Summer
14	Garmi...	GER	GM	1936	Winter	1936Winter
15	Barcel...	ESP	SP	1992	Summer	1992Summer

Step 7: Rename the column as **EditionID**.

The screenshot shows the Microsoft Excel interface with the PowerPivot ribbon selected. In the PivotTable Fields pane on the right, the 'Edition' column is being renamed to 'EditionID'. The formula bar at the top displays the DAX formula `=CONCATENATE([Edition], [Season])`. The main worksheet area shows a list of Olympic editions with columns for City, NOC_CountryRegion, Alpha-2 Code, Edition, Season, and EditionID.

Step 8: Now, Select the **Medals** Table.

Step 9: Select **Add Column**.

Step 10: In the Formula Bar, type the DAX Formula,

`=YEAR ([EDITION])`

and press **Enter**.

Step 11: Rename the Column as **Year**.

The screenshot shows the Microsoft Excel interface with the PowerPivot ribbon selected. In the PivotTable Fields pane on the right, the 'Edition' column is being renamed to 'Year'. The formula bar at the top displays the DAX formula `=YEAR([Edition])`. The main worksheet area shows the 'Medals' table with columns for event_gender, Sport, Discipline, Event, Medal, MedalKey, DisciplineEvent, and Year.

Step 12: Select **Add Column**.

Step 13: Type in the Formula Bar,

`=CONCATENATE ([Year], [Season])`

A new column with values similar to those in the **EditionID** column in Hosts Table gets created.

Step 14: Rename the column as **EditionID**.

Step 15: Sort the Column in Ascending Order.

The screenshot shows the Microsoft Excel ribbon with the 'PowerPivot for Excel - Data Model.xlsx' file open. In the 'PivotTable Fields' pane, a calculated column 'EditionID' is being added to the table, defined as `=CONCATENATE([Year], [Season])`. The table is sorted by 'EditionID'. The PivotTable Fields pane also shows other fields like Disciplines, Events, Medals, S_Teams, W_Teams, Sports, and Hosts.

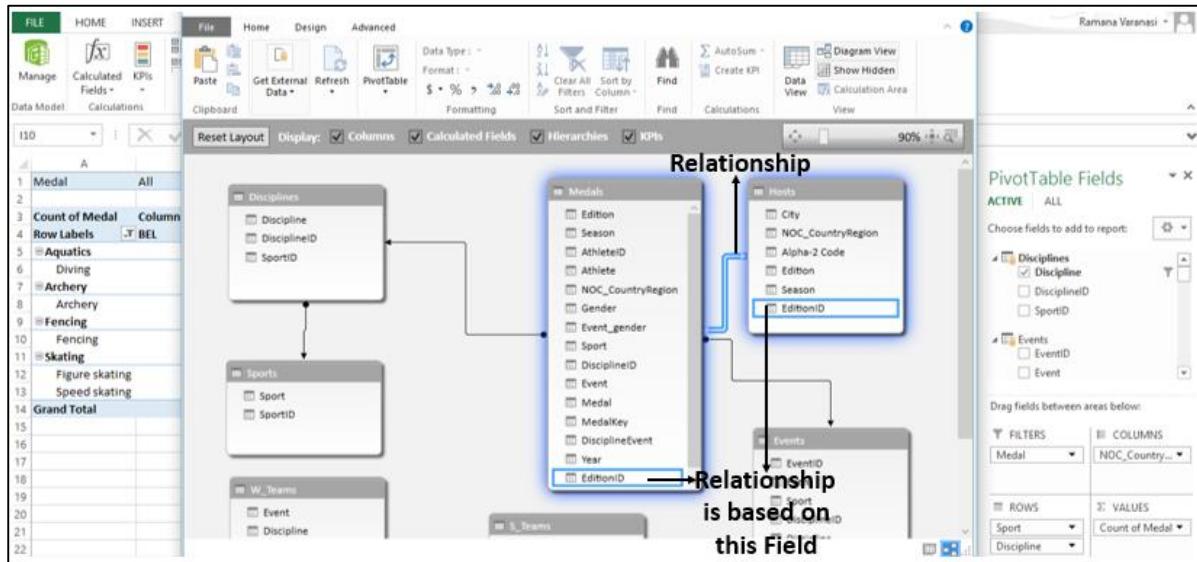
Relationship using calculated columns

Step 1: Switch to **Diagram View**. Ensure that the tables **Medals** and **Hosts** are close to each other.

The screenshot shows the Microsoft Excel ribbon with the 'PowerPivot for Excel - Data Model.xlsx' file open. The 'Diagram View' is selected. The diagram shows relationships between tables: Disciplines, Sports, W_Teams, S_Teams, Medals, Events, and Hosts. The Medals and Hosts tables are highlighted with arrows pointing to them. The PivotTable Fields pane on the right shows fields from the Medals and Hosts tables.

Step 2: Drag the **EditionID** column in **Medals** to the **EditionID** column in **Hosts**.

PowerPivot creates a relationship between the two tables. A **line** between the two tables, indicates the relationship. The **EditionID** Field in both the tables is highlighted indicating that the relationship is based on the column **EditionID**.



14. Excel – External Data Connection

Once you connect your Excel workbook to an external data source, such as a SQL Server database, Access database or another Excel workbook, you can keep the data in your workbook up to date by "refreshing" the link to its source. Each time you refresh the connection, you see the most recent data, including anything that is new or has been deleted.

Let us see how to refresh PowerPivot data.

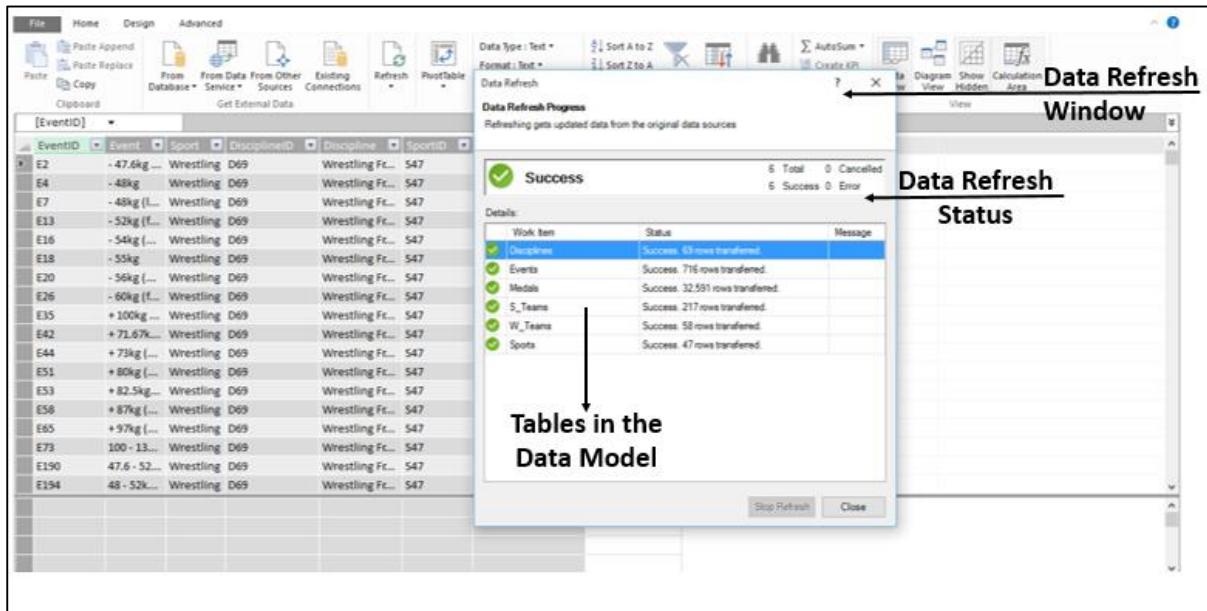
Step 1: Switch to the **Data View**.

Step 2: Click on **Refresh**.

Step 3: Click on **Refresh All**.

The screenshot shows the Microsoft Excel ribbon with the 'PowerPivot' tab selected. The 'Data' tab is also visible. In the center of the ribbon, there is a 'Refresh' button. Below the ribbon, a data table is displayed with columns for EventID, Event, Sport, DisciplineID, Discipline, SportID, and DisciplineEventID. The table contains approximately 194 rows of wrestling data. A red arrow points to the 'Refresh All' button located in the bottom right corner of the ribbon area.

The **Data Refresh** window appears showing all the Data Tables in the **Data Model** and tracking the refreshing progress. After the refresh is complete, the status is displayed.



Step 4: Click on Close. The data in your Data Model is updated.

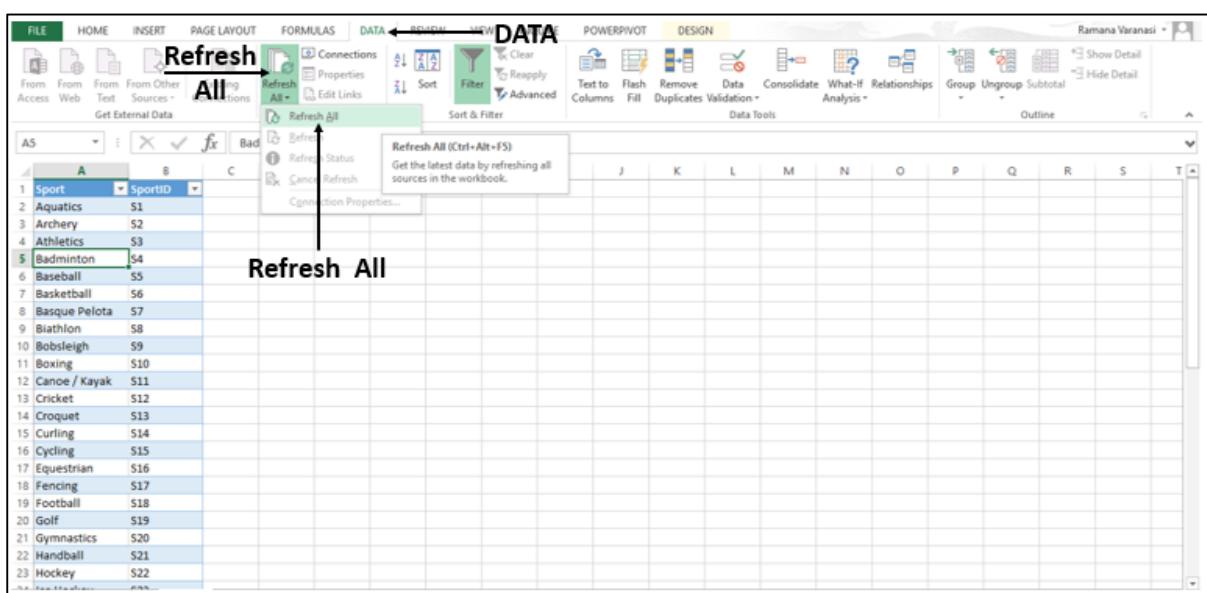
Update the Data Connections

Step 1: Click any cell in the table that contains the link to the imported data file.

Step 2: Click on the **Data** tab.

Step 3: Click on **Refresh All** in Connections group.

Step 4: In the drop-down list, click on **Refresh All**. All the data connections in the Workbook will be updated.



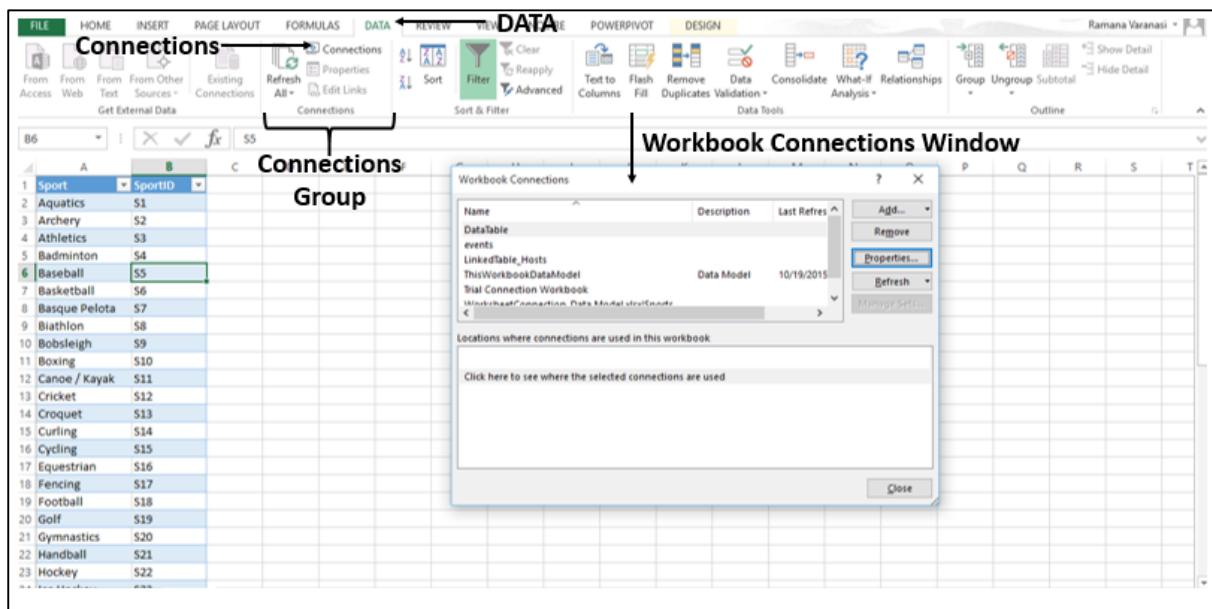
Automatically Refresh Data

Here we will learn how to refresh the data automatically when the workbook is opened.

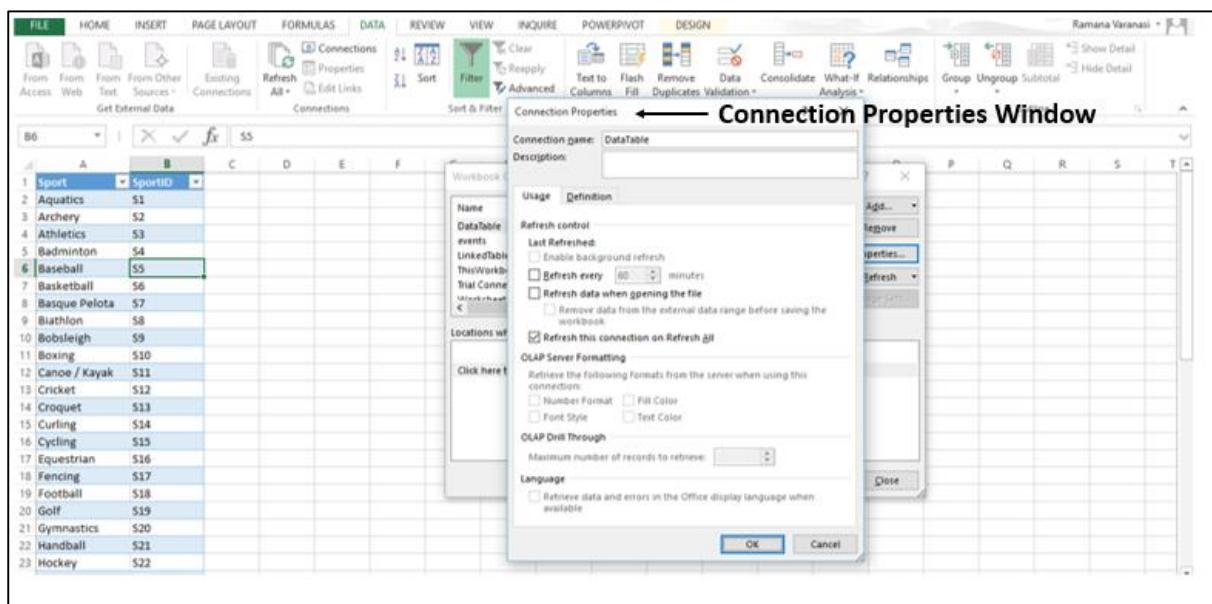
Step 1: Click any cell in the table that contains the link to the imported Data file.

Step 2: Click on the **Data** tab.

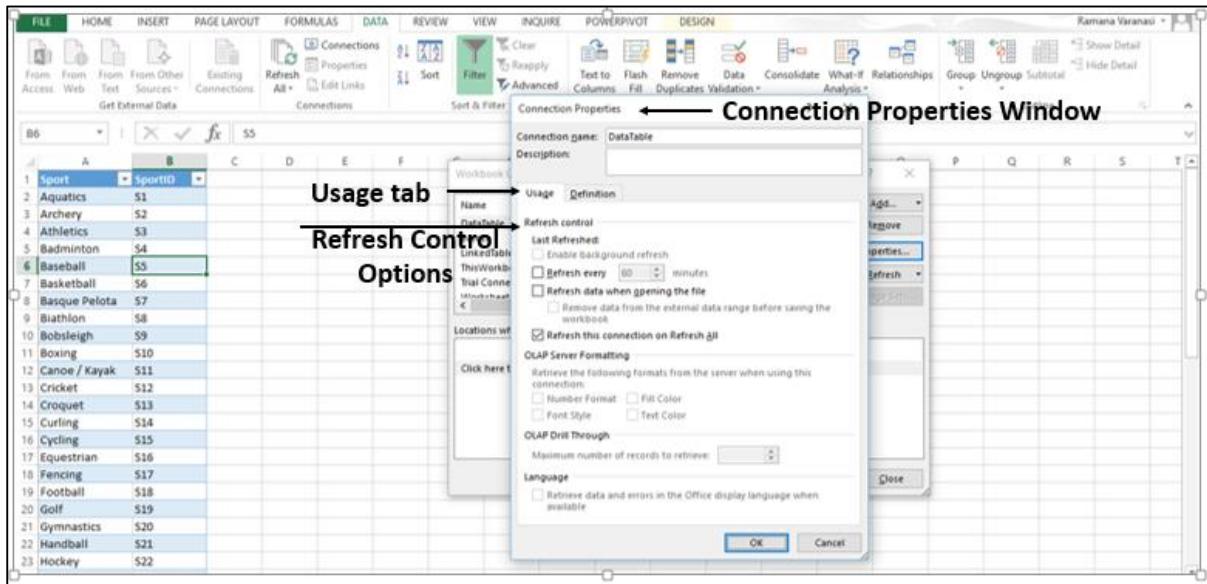
Step 3: Click on **Connections** in the **Connections** group. The **Workbook Connections** window appears.



Step 4: Click on **Properties**. The **Connection Properties** Window appears.



Step 5: You will find a **Usage** tab and a **Definition** tab. Click on the **Usage** tab. The options for **Refresh Control** appear.

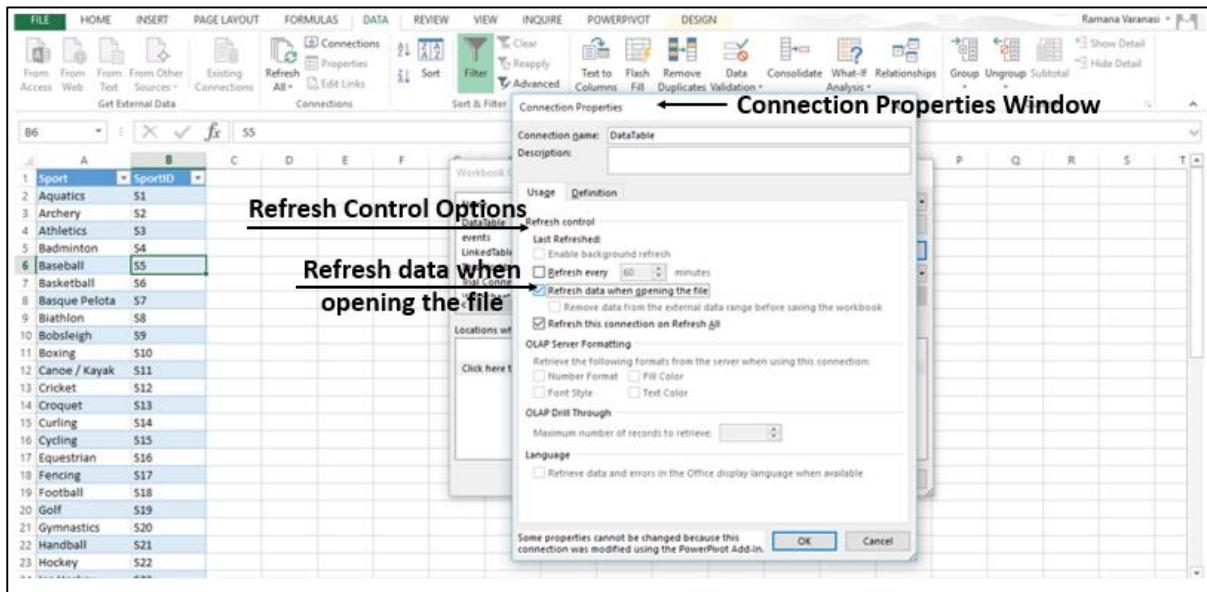


Step 6: Select **Refresh data** while opening the file.

You also have an option under this: '**Remove data from the external data range before saving the workbook**'. You can use this option to save the workbook with the query definition but without the external data.

Step 7: Click **OK**.

Whenever you open your Workbook, the up-to-date data will be loaded into your Workbook.



Automatically refresh data at regular intervals

Step 1: Click any cell in the table that contains the link to the imported Data file.

Step 2: Click on the **Data** tab.

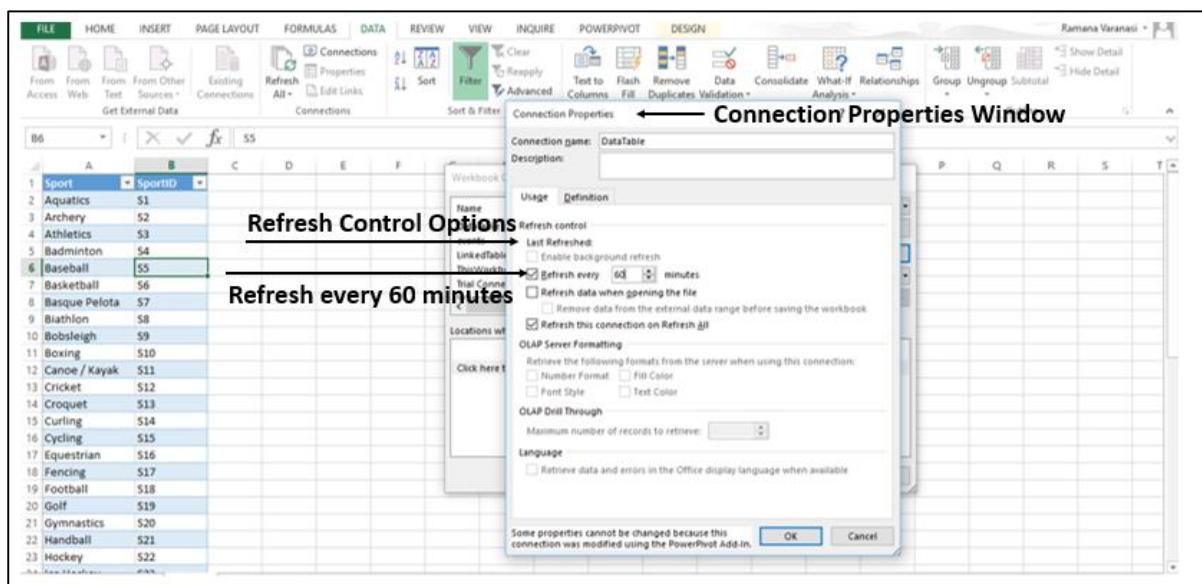
Step 3: Click on the **Connections** option in **Connections** group. A **Workbook Connections** window appears.

Step 4: Click on **Properties**. A **Connection Properties** Window appears.

Step 5: Click on the **Usage** tab. The options for **Refresh Control** appear.

Step 6: Now, select “Refresh every” and enter 60 minutes between each refresh operation.

Step 7: Click **OK**. Your data will be refreshed every 60 minute that is every hour.



Enable Background Refresh

For very large data sets, consider running a background refresh. This returns the control of Excel to you instead of making you wait several minutes for the **refresh** to finish. You can use this option when you are running a query in the background. However, you cannot run a query for any connection type that retrieves data for the Data Model.

Step 1: Click any cell in the table that contains the link to the imported Data file.

Step 2: Click on the **Data** tab.

Step 3: Click on **Connections** in the **Connections** group. The **Workbook Connections** window appears.

Step 4: Click on **Properties**. **Connection Properties** Window appears.

Step 5: Click on the **Usage** tab. The **Refresh Control** options appear.

Step 6: Click on **Enable background refresh** and then click **OK**.

15. Excel – Pivot Table Tools

Source Data for a PivotTable

You can change the **range of the source data** of a PivotTable. For example, you can expand the source data to include more rows of data.

However, if the source data has been changed substantially, such as having more or fewer columns, consider creating a new PivotTable.

Step 1: Click anywhere in the PivotTable. The **PIVOTTABLE TOOLS** appear on the ribbon, with an option named **ANALYZE**.

Step 2: Click on the option- **ANALYZE**.

Step 3: Click on **Change Data Source** in the **Data** group.

The screenshot shows a Microsoft Excel spreadsheet titled "Excel2013_Pivot_Practice.xlsx". The ribbon is displayed with the "PIVOTTABLE TOOLS" tab selected, specifically the "ANALYZE" tab. On the left, a PivotTable is visible with data for "Region" (East, North, South, West) and "Month" (January, February, March). The "PivotTable Fields" pane on the right lists fields: Salesperson, Region, Account, Order Amount, and Month, all checked. A callout points to the "Data Group" button in the ribbon and the "Change Data Source" button in the PivotTable Fields pane.

	Sum of Order Amount	January	February	March	Grand Total
Row Labels	East	1690	1950	700	4340
	Albertson, Kathy	925	1375	350	2650
	Post, Melissa	765	575	350	1690
	North	1140	1720	300	3160
	Thompson, Shannon	1140	1720	300	3160
	South	3110	3975	3790	10875
	Davis, William	1100	235	600	1935
	Flores, Ila	1655	985	1925	4565
	Walters, Chris	355	2755	1265	4375
	West	3150	1515	525	5190
	Brennan, Michael	2750	550	400	3700
	Dumiao, Richard	400	965	125	1490
	Grand Total	9090	9160	5315	23565

Step 4: Click on **Change Data Source**. The current Data Source is highlighted. The **Change PivotTable Data Source** Window appears.

Step 5: In the **Table/Range** Box, select the Table/Range you want to include.

Step 6: Click **OK**.

The screenshot shows a Microsoft Excel spreadsheet with a PivotTable named 'Table1'. The PivotTable has columns for Salesperson, Region, Account, Order Amount, and Month. A callout arrow points from the text 'Source Window' to the title bar of the 'Change PivotTable Data Source' dialog box. Another callout arrow points from the text 'Table/Range Box' to the 'Table/Range' dropdown menu in the dialog box. A third callout arrow points from the text 'PivotTable Data Source' to the 'Source' tab in the dialog box.

Change to a Different External Data Source.

If you want to base your PivotTable on a different external source, it might be best to create a new PivotTable. If the location of your external data source is changed, for example, your SQL Server database name is the same, but it has been moved to a different server, or your Access database has been moved to another network share, you can change your current connection.

Step 1: Click anywhere in the PivotTable. The **PIVOTTABLE TOOLS** appear on the Ribbon, with an **ANALYZE** option.

Step 2: Click **ANALYZE**.

Step 3: Click on **Change Data Source** in the **Data** Group. The **Change PivotTable Data Source** window appears.

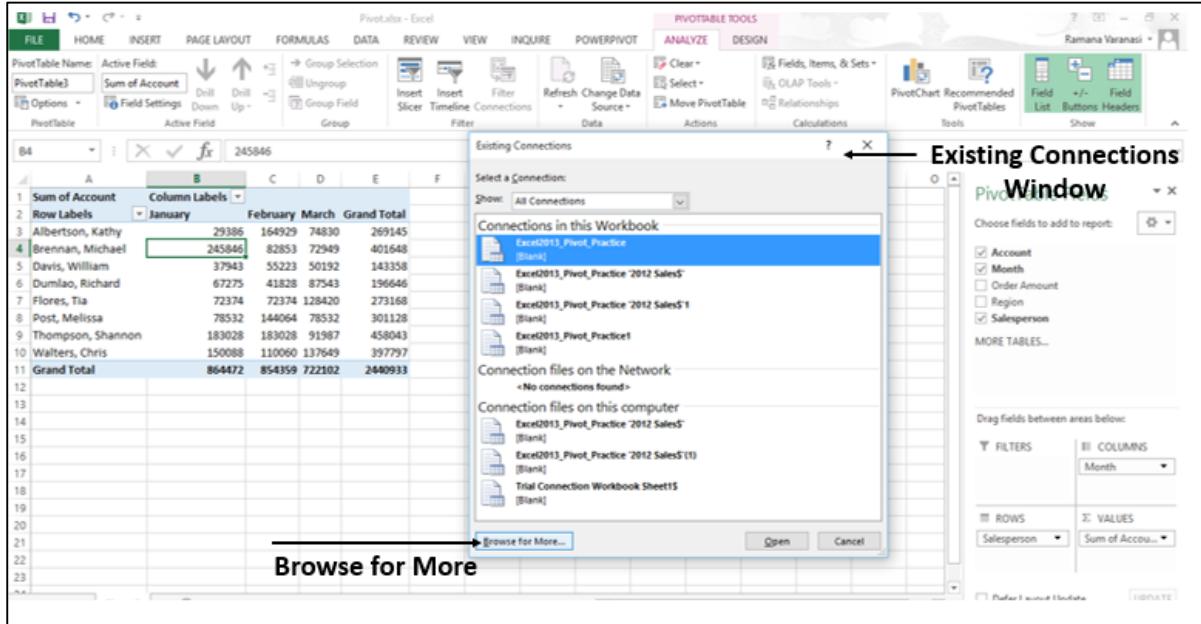
Step 4: Click on the option **Choose Connection**.

The screenshot shows a Microsoft Excel spreadsheet with a PivotTable. A callout arrow points from the text 'Choose Connection' to the 'Choose Connection...' button in the 'Change PivotTable Data Source' dialog box.

A window appears showing all the **Existing Connections**.

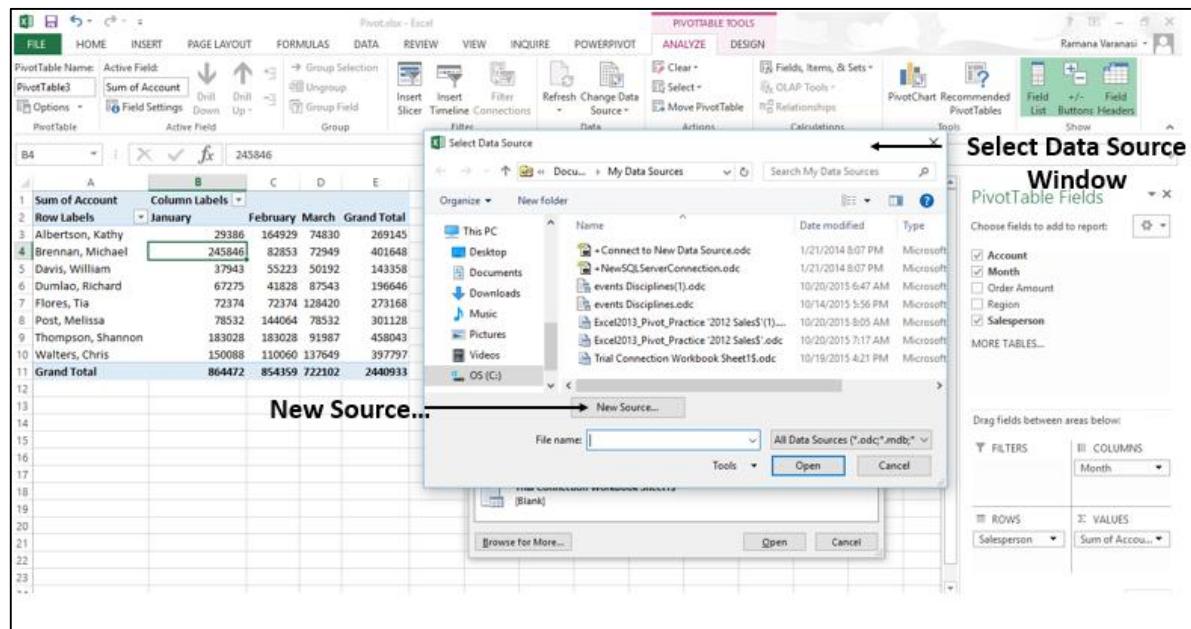
In the **Show** box, keep **All Connections** selected. All the Connections in your Workbook will be displayed.

Step 5: Click on **Browse for More...**



The **Select Data Source** window appears.

Step 6: Click on **New Source**. Go through the **Data Connection Wizard** Steps.



Alternatively, specify the **File name**, if your **Data** is contained in another Excel Workbook.

The screenshot shows a Microsoft Excel window titled "PivotTable - Excel". A PivotTable is visible on the left side, showing sales data for various months and salespeople. On the ribbon, the "PIVOTTABLE TOOLS" tab is selected, specifically the "ANALYZE" tab. A "Select Data Source" dialog box is overlaid on the main window. This dialog box has a title bar "Select Data Source Window" and a sub-section "PivotTable Fields". It contains a list of files under "This PC" and a "File name" input field where "Blank" is typed. Below the file list, there are sections for "Choose fields to add to report:" and "Drag fields between areas below:". The "ROWS" section has "Salesperson" selected, and the "VALUES" section has "Sum of Account" selected. Buttons for "Open" and "Cancel" are at the bottom of the dialog.

Delete a PivotTable

Step 1: Click anywhere on the **PivotTable**. The **PIVOTTABLE TOOLS** appear on the Ribbon, with the **ANALYZE** option.

Step 2: Click on the **ANALYZE** tab.

Step 3: Click on **Select** in the **Actions** Group as shown in the image given below.

The screenshot shows a Microsoft Excel window titled "PivotTable - Excel". A PivotTable is visible on the left side, showing sales data for various months and salespeople. On the ribbon, the "PIVOTTABLE TOOLS" tab is selected, specifically the "ANALYZE" tab. A callout points to the "Select" button in the "Actions" group. The "Actions" group also includes "Clear", "Filter", "Refresh Change Data", "Source", and "Data". To the right of the ribbon, the "PivotTable Fields" pane is open, showing fields for "Account", "Month", "Order Amount", "Region", and "Salesperson". The "ROWS" section has "Salesperson" selected, and the "VALUES" section has "Sum of Account" selected. The main worksheet area shows the same sales data as the first screenshot.

Step 4: Click on **Entire PivotTable**. The entire PivotTable will be selected.

The screenshot shows the Microsoft Excel ribbon with the 'PIVOTTABLE TOOLS' tab selected. Under the 'ANALYZE' tab, the 'Select' dropdown is open, and 'Entire PivotTable' is highlighted with a green arrow pointing to it. The main area of the screen displays a PivotTable with data from January to March for various salespeople, with a grand total row at the bottom. The PivotTable Fields pane on the right lists fields like Account, Month, Order Amount, Region, and Salesperson.

	Sum of Account	Column Labels	January	February	March	Grand Total
1	Row Labels					
2						
3	Albertson, Kathy		29386	164929	74830	269145
4	Brennan, Michael		245846	82853	72949	401648
5	Davis, William		37943	55223	50192	143358
6	Dumlaoo, Richard		67275	41828	87543	196646
7	Flores, Tia		72374	72374	128420	273168
8	Post, Melissa		78532	144064	78532	301128
9	Thompson, Shannon		183028	183028	91987	458043
10	Walters, Chris		150088	110060	137649	397797
11	Grand Total		864472	854359	722102	2440933

Step 5: Press the **Delete** Key.

The screenshot shows the Microsoft Excel ribbon with the 'HOME' tab selected. The entire PivotTable from the previous screenshot is selected and highlighted with a green border. A double-headed arrow points to the text 'Entire PivotTable is deleted'.

If the PivotTable is on a separate Worksheet, you can delete the PivotTable by deleting the entire Worksheet also. To do this, follow the steps given below.

Step 1: Right-click on the **Worksheet tab**.

Step 2: Click on **Delete**.

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3	Sum of Order Amount	Column Labels	January	February	March	Grand Total						
4	Row Labels		1690	1950	700	4340						
5	East		925	1375	350	2650						
6	Albertson, Kathy		765	575	350	1690						
7	Post, Melissa		1140	1720	300	3160						
8	North		1140	1720	300	3160						
9	Thompson, Shannon		1140	1720	300	3160						
10	South		3110	3975	3790	10875						
11	Davis, William		1100	235	600	1935						
12	Flores, Tia		1655	985	1925	4565						
13	Walters, Chris		355	2755	1265	4375						
14	West		3150	1515	525	5190						
15	Brennan, Michael		2750	550	400	3700						
16	Dumiao, Richard		400	965	125	1490						
17	Grand Total		9090	9160	5315	23565						
18												
19												
20												
21												

You get a warning message, saying that you cannot **Undo Delete** and might lose some data. Since, you are deleting only the **PivotTable Sheet** you can delete the worksheet.

Step 3: Click on **Delete**.

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3	Sum of Order Amount	Column Labels	January	February	March	Grand Total						
4	Row Labels		1690	1950	700	4340						
5	East		925	1375	350	2650						
6	Albertson, Kathy		765	575	350	1690						
7	Post, Melissa		1140	1720	300	3160						
8	North		1140	1720	300	3160						
9	Thompson, Shannon		1140	1720	300	3160						
10	South		3110	3975	3790	10875						
11	Davis, William		1100	235	600	1935						
12	Flores, Tia		1655	985	1925	4565						
13	Walters, Chris		355	2755	1265	4375						
14	West		3150	1515	525	5190						
15	Brennan, Michael		2750	550	400	3700						
16	Dumiao, Richard		400	965	125	1490						
17	Grand Total		9090	9160	5315	23565						
18												
19												
20												
21												

The PivotTable worksheet will be **deleted**.

A screenshot of Microsoft Excel showing a PivotTable worksheet. The PivotTable is displayed in the range A2:P22. The columns are labeled Salesperson, Region, Account, Order Amount, and Month. The data shows sales records for various salespeople across different regions and months. The PivotTable is currently selected, and the status bar at the bottom of the screen displays the message "PivotTable Worksheet is Deleted". The ribbon at the top shows the "TABLE TOOLS" tab is selected.

Salesperson	Region	Account	Order Amount	Month
Albertson, Kathy	East	29386	\$925.00	January
Albertson, Kathy	East	74830	\$875.00	February
Albertson, Kathy	East	90099	\$500.00	February
Albertson, Kathy	East	74830	\$350.00	March
Brennan, Michael	West	82853	\$400.00	January
Brennan, Michael	West	72949	\$850.00	January
Brennan, Michael	West	90044	\$1,500.00	January
Brennan, Michael	West	82853	\$550.00	February
Brennan, Michael	West	72949	\$400.00	March
Davis, William	South	55223	\$235.00	February
Davis, William	South	10354	\$850.00	January
Davis, William	South	50192	\$600.00	March
Davis, William	South	27589	\$250.00	January
Dumiao, Richard	West	67275	\$400.00	January
Dumiao, Richard	West	41828	\$965.00	February
Dumiao, Richard	West	87543	\$125.00	March
Flores, Tia	South	97446	\$1,500.00	March
Flores, Tia	South	41400	\$305.00	January
Flores, Tia	South	30974	\$1,350.00	January
Flores, Tia	South	41400	\$435.00	February
Flores, Tia	South	30974	\$550.00	February

Using the Timeline

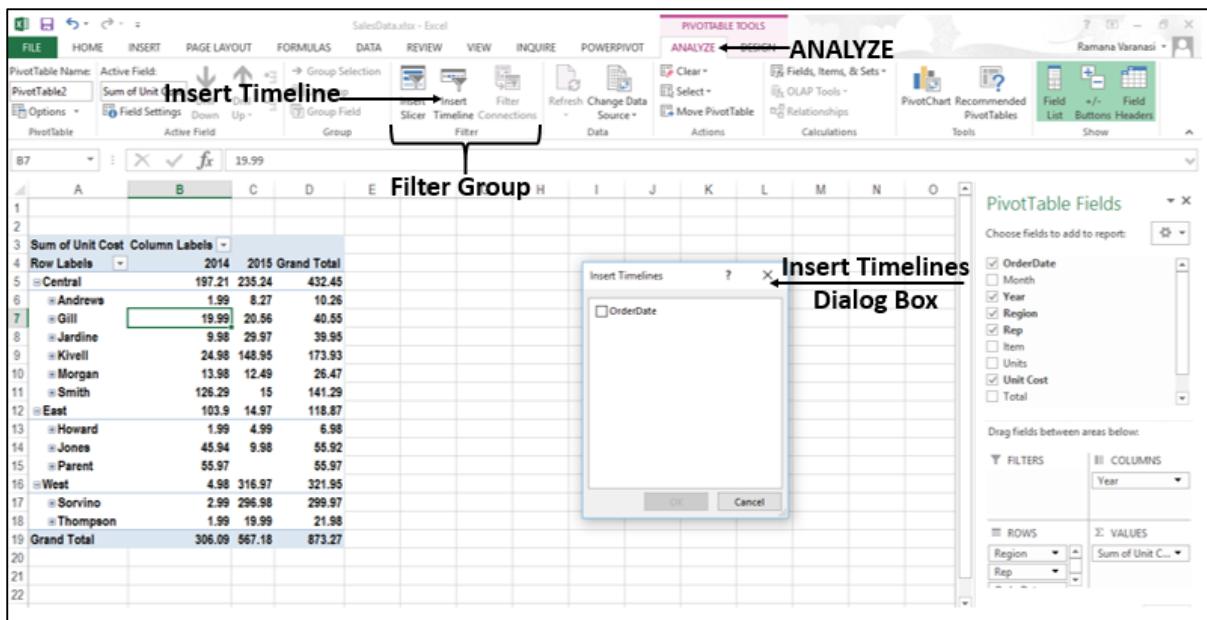
A **PivotTable Timeline** is a **box** that you can add to your **PivotTable** that lets you **filter by time**, and **zoom in on the period you want**. This is a better option compared to playing around with the filters to show the dates.

It is like a slicer you create to filter data, and once you create it, you can keep it with your PivotTable. This makes it possible for you to change the time period dynamically.

Step 1: Click anywhere in the PivotTable. The **PIVOTTABLE TOOLS** appear on the Ribbon, with **ANALYZE** option.

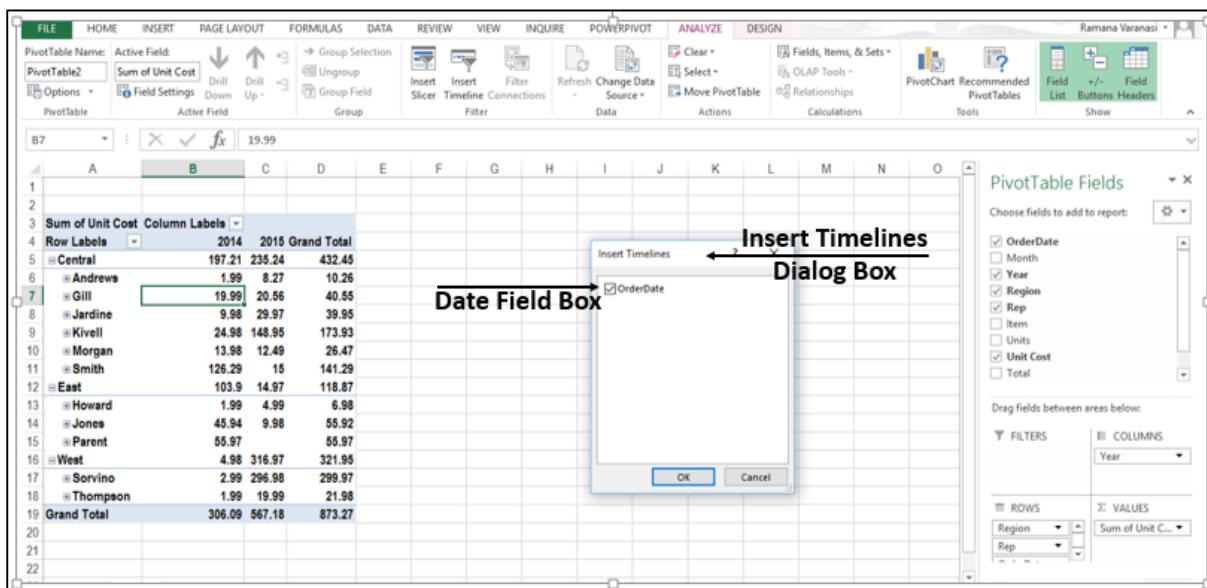
Step 2: Click **ANALYZE**.

Step 3: Click on **Insert Timeline** in the **Filter** group. An **Insert Timelines** Dialog Box appears.



Step 4: In the **Insert Timelines** dialog box, click on the boxes of the date fields you want.

Step 5: Click **OK**.



The timeline for your PivotTable is in place.

A screenshot of Microsoft Excel showing a PivotTable. The PivotTable Fields pane on the right shows fields like OrderDate, Month, Year, Region, Rep, Item, Units, Unit Cost, and Total. A Timeline filter is applied to the OrderDate field, showing months from JN to DEC. An arrow points to the Timeline button with the label "Timeline".

Use a Timeline to Filter by Time Period

Now, you can filter the **PivotTable using the timeline** by a **time period** in one of **four time levels; Years, Quarters, Months or Days**.

Step 1: Click the small arrow next to the **time level-Months**. The four time levels will be displayed.

A screenshot of Microsoft Excel showing a PivotTable. The PivotTable Fields pane on the right shows fields like OrderDate, Month, Year, Region, Rep, Item, Units, Unit Cost, and Total. A Timeline filter is applied to the OrderDate field, showing months from JN to NOV. An arrow points to the "MONTHS" button in the Timeline dropdown menu, which also includes options for YEARS, QUARTERS, and DAYS. A bracket indicates the four time levels: YEARS, QUARTERS, MONTHS, and DAYS. The label "Time level" is above the dropdown menu.

Step 2: Click on **Quarters**. The Timeline filter changes to **Quarters**.

The screenshot shows a Microsoft Excel interface with a PivotTable. The PivotTable Fields pane on the right lists fields: OrderDate, Month, Year, Region, Rep, Item, Units, Unit Cost, and Total. The PivotTable itself displays data for 'Sum of Unit Cost' across 'Row Labels' (Region) and 'Column Labels' (Year, OrderDate). A 'Timeline Filter' dialog box is open, showing 'QUARTERS' selected. An annotation with an arrow points to the 'Timeline Filter' button in the dialog box, with the text 'Timeline Filter changed to Quarters'.

Step 3: Click on Q1 2015. The **Timespan Control** is highlighted. The PivotTable Data is filtered to Q1 2015.

Step 4: Drag the **Timespan handle** to include Q2 2015. The PivotTable Data is filtered to include Q1, Q2 2015.

The screenshot shows the same Microsoft Excel interface with the PivotTable and Timeline filter dialog box. The dialog box now shows 'Q1 - Q2 2015'. A large black arrow points from the text 'Timespan Control' to the timeline bar in the dialog box. Another arrow points from the text 'Timespan Handle' to the handle on the right side of the timeline bar. The PivotTable data reflects the new filter.

At any point of time, to clear timeline, click on the **Clear Filter** button.

The screenshot shows a Microsoft Excel interface with a PivotTable Fields pane open on the right side. In the center, there is a 'OrderDate' timeline filter dialog box. At the top right of this dialog box, there is a red box highlighting the 'Clear Filter' button. The PivotTable Fields pane on the right lists various fields like OrderDate, Month, Year, Region, Rep, Item, Units, Unit Cost, and Total, with checkboxes indicating their status. The 'Year' checkbox is checked. The 'ROWS' section shows 'Region' and 'Rep' as categories, and the 'VALUES' section shows 'Sum of Unit Cost'.

The timeline is cleared as shown in the image given below.

This screenshot is similar to the one above, but the 'OrderDate' timeline filter dialog box now shows 'All Periods' instead of specific quarters. A black arrow points from the text 'Timeline got cleared' to the 'All Periods' label in the dialog box. The rest of the interface, including the PivotTable Fields pane, remains the same.

Create a Standalone PivotChart

You can create a PivotChart without creating a PivotTable first. You can even create a PivotChart that is recommended for your data. Excel will then create a coupled PivotTable automatically.

Step 1: Click anywhere on the **Data Table**.

Step 2: Click on the **Insert** tab.

Step 3: In the **Charts Group**, Click on **Recommended Charts**.

The screenshot shows the Microsoft Excel ribbon with the 'INSERT' tab selected. In the 'CHARTS' section of the ribbon, the 'RECOMMENDED CHARTS' tab is highlighted. A callout arrow points from the text 'Data Table' to the range A3:P24, which contains a sales dataset. The chart area is currently empty.

The **Insert Chart** Window appears.

Step 4: Click on the **Recommended Charts** tab. The charts with the PivotChart icon in the top corner are PivotCharts.

The screenshot shows the 'Insert Chart' dialog box with the 'RECOMMENDED CHARTS' tab selected. A callout arrow points to the 'PivotChart Icon' located on the clustered column chart preview. Another callout arrow points to the 'Normal Chart' located on the line chart preview. The dialog box also displays a description of the clustered column chart: 'A clustered column chart is used to compare values across a few categories. Use it when the order of categories is not important.' At the bottom right of the dialog box are 'OK' and 'Cancel' buttons.

Step 5: Click on a **PivotChart**. A Preview appears on the Right side.

The screenshot shows the Microsoft Excel ribbon with the 'Insert' tab selected. On the left, a PivotTable is displayed with data for Salesperson, Region, Account, and Order Amount. On the right, the 'Insert Chart' dialog box is open, showing 'Recommended Charts' and 'All Charts' tabs. A 'Clustered Bar' chart is selected and previewed. The chart title is 'Sum of Order Amount by Salesperson and Month'. The legend indicates three series: March (light blue), February (medium blue), and January (dark blue). The chart shows sales figures for different months across various salespeople. An annotation 'PivotChart selected' points to the chart area.

Step 6: Click **OK** once you find the **PivotChart** you want.

Your standalone PivotChart for your Data is available to you.

The screenshot shows a Microsoft Excel spreadsheet with a PivotTable on the left and a PivotChart on the right. The PivotTable has columns for Salesperson, Month, and Order Amount. The PivotChart, titled 'Sum of Order Amount by Salesperson and Month', displays the same data as the PivotTable. The chart uses a clustered bar format with three series: March (light blue), February (medium blue), and January (dark blue). The chart is positioned next to the PivotTable, illustrating how they can be used together. An annotation 'PivotChart' points to the chart area.

Part 5: Powerful Data Analysis – 2

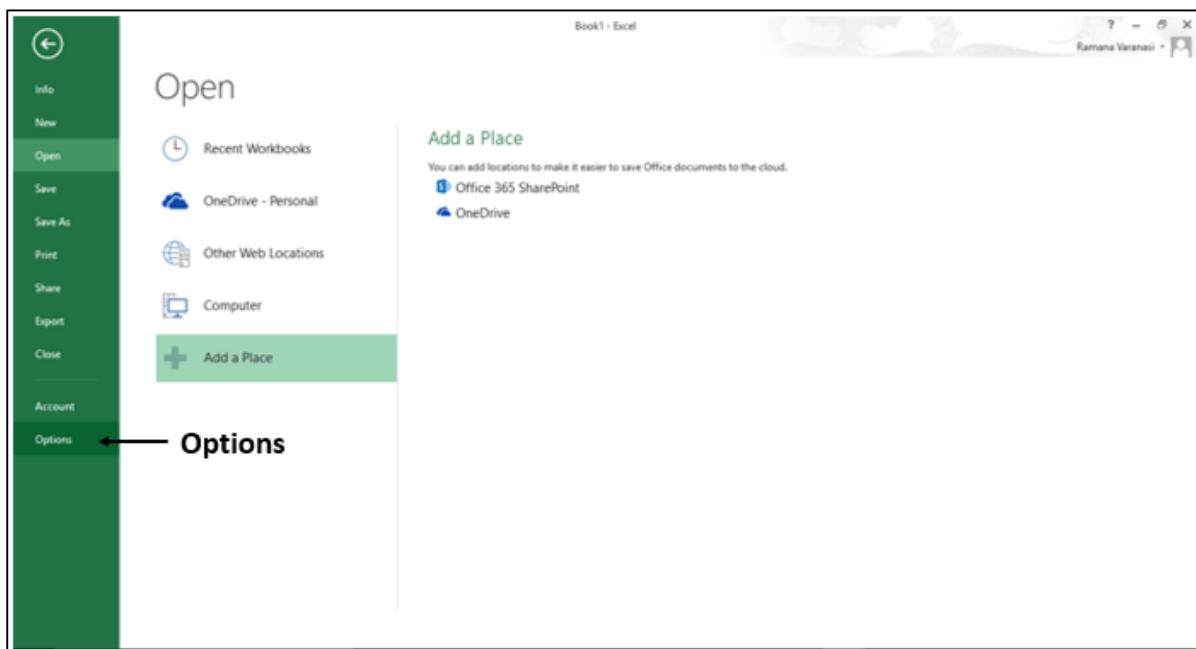
16. Excel – Power View

Power View is a feature of Microsoft Excel 2013 that enables **interactive** data exploration, visualization, and presentation encouraging intuitive ad-hoc reporting.

Create a Power View Sheet

Make sure **Power View** add-in is enabled in Excel 2013.

Step 1: Click on the **File** menu and then Click on **Options**.

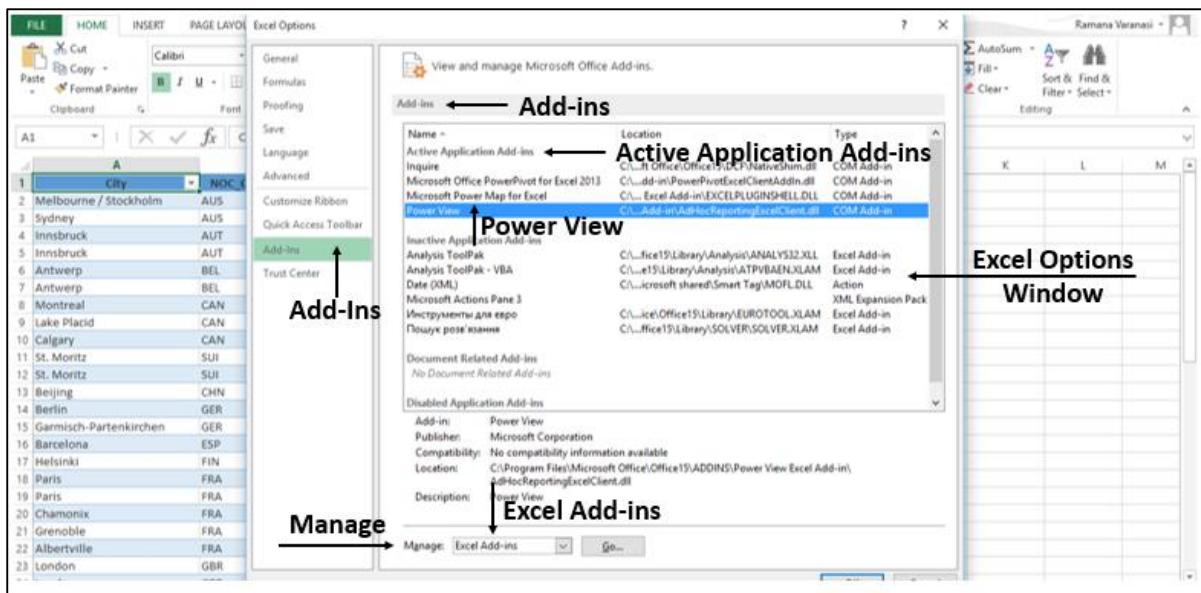


The **Excel Options** window appears.

Step 2: Click on **Add-Ins**.

Step 3: In the **Manage** box, click the drop-down arrow and select **Excel Add-ins**.

Step 4: All the available **Add-ins** will be displayed. If **Power View** Add-in is enabled, it appears in Active Application Add-ins.



If it does not appear, follow these steps:

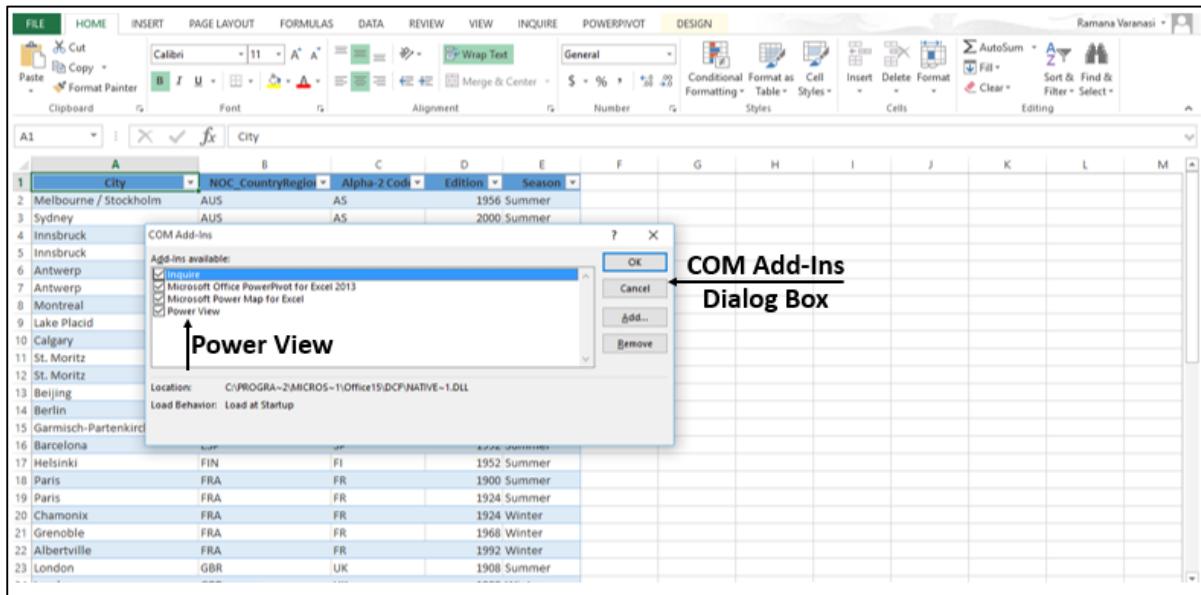
Step 1: In the **Excel Options** Window, Click on **Add-Ins**.

Step 2: In the **Manage** box, click the drop-down arrow and select **COM Add-ins**

Step 3: Click on the **Go** button. A **COM Add-Ins** Dialog Box appears.

Step 4: Check the **Power View** Check Box.

Step 5: Click **OK**.



Now, you are ready to create the **Power View sheet**.

Step 1: Click on the **Data Table**.

Step 2: Click on **Insert** tab.

Step 3: Click on **Power View** in Reports Group.

The screenshot shows the Microsoft Excel ribbon with the 'INSERT' tab selected. Below the ribbon, a table of data is displayed. To the right of the table, the 'Reports' group in the ribbon is highlighted, and the 'Power View' icon is selected, indicated by a callout bubble.

A	B	C	D	E	
1	City	NOC_CountryRegion	Alpha-2 Code	Edition	Season
2	Melbourne / Stockholm	AUS	AS	1956	Summer
3	Sydney	AUS	AS	2000	Summer
4	Innsbruck	AUT	AT	1964	Winter
5	Innsbruck	AUT	AT	1976	Winter
6	Antwerp	BEL	BE	1920	Summer
7	Antwerp	BEL	BE	1920	Winter
8	Montreal	CAN	CA	1976	Summer
9	Lake Placid	CAN	CA	1980	Winter
10	Calgary	CAN	CA	1988	Winter
11	St. Moritz	SUI	SZ	1928	Winter
12	St. Moritz	SUI	SZ	1948	Winter
13	Beijing	CHN	CH	2008	Summer
14	Berlin	GER	GM	1936	Summer
15	Garmisch-Partenkirchen	GER	GM	1936	Winter
16	Barcelona	ESP	SP	1992	Summer
17	Helsinki	FIN	FI	1952	Summer
18	Paris	FRA	FR	1900	Summer
19	Paris	FRA	FR	1924	Summer
20	Chamonix	FRA	FR	1924	Winter
21	Grenoble	FRA	FR	1968	Winter
22	Albertville	FRA	FR	1992	Winter
23	London	GBR	UK	1908	Summer

An **Opening Power View** window opens, showing the progress of Working on opening Power View sheet.

The screenshot shows the Microsoft Excel ribbon with the 'INSERT' tab selected. A progress dialog box titled 'Opening Power View' is overlaid on the worksheet, showing the status 'Working on opening Power View sheet...'. The dialog box has a green progress bar and a 'Cancel' button.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	City	NOC_CountryRegion	Alpha-2 Code	Edition	Season							
2	Melbourne / Stockholm	AUS	AS	1956	Summer							
3	Sydney	AUS	AS	2000	Summer							
4	Innsbruck	AUT	AT	1964	Winter							
5	Innsbruck	AUT	AT									
6	Antwerp	BEL	BE									
7	Antwerp	BEL	BE									
8	Montreal	CAN	CA									
9	Lake Placid	CAN	CA									
10	Calgary	CAN	CA									
11	St. Moritz	SUI	SZ									
12	St. Moritz	SUI	SZ	1948	Winter							
13	Beijing	CHN	CH	2008	Summer							
14	Berlin	GER	GM	1936	Summer							
15	Garmisch-Partenkirchen	GER	GM	1936	Winter							
16	Barcelona	ESP	SP	1992	Summer							
17	Helsinki	FIN	FI	1952	Summer							
18	Paris	FRA	FR	1900	Summer							
19	Paris	FRA	FR	1924	Summer							
20	Chamonix	FRA	FR	1924	Winter							
21	Grenoble	FRA	FR	1968	Winter							
22	Albertville	FRA	FR	1992	Winter							
23	London	GBR	UK	1908	Summer							

The **Power View sheet** is created for you and added to your Workbook with the **Power View**. On the Right-side of the **Power View**, you find the **Power View Fields**. Under the **Power View Fields** you will find **Areas**.

In the Ribbon, if you click on **Design tab**, you will find various **Visualization options**.

The screenshot shows the Microsoft Excel ribbon with the 'Design' tab selected. On the left, there's a 'Visualization' group with options like Table, Bar, Column, Other, Map, Chart, Slicer, Card, Show Levels, and Options. Below this is a 'Tiles' section with sub-options: Tiles, Type, Slicer, Style, Show, Totals, Number, Text, and Arrange. A 'Switch Visualizations' button is also present.

Power View Fields: This pane is titled 'Power View Fields ACTIVE | ALL'. It contains a list of checked fields: Alpha-2 Code, City, Edition, EditionID, NOC_CountryRegion, and Season. There's also a 'Drag fields between areas below' section with 'TITLE BY' and a 'FIELDS' section containing City, NOC_CountryRegion, Alpha-2 Code, Edition, and Season.

Power View: This is indicated by an arrow pointing to the main content area where a table of data is displayed. The table has columns: NOC_CountryRegion, Alpha-2 Code, Edition, and Season. The first row (Albertville) is selected.

Power View Sheet: This is indicated by an arrow pointing to the bottom of the screen where a navigation bar is shown with tabs: Medals, Sports, Hosts, and Power View1 (which is currently active).

17. Excel – Visualizations

You can quickly create a number of different data visualizations that suit your data using **Power View**. The visualizations possible are Tables, Matrices, Cards, Tiles, Maps, Charts such as Bar, Column, Scatter, Line, Pie and Bubble Charts, and sets of multiple charts (charts with same axis).

Create Charts and other Visualizations

For every visualization you want to create, you start on a Power View sheet by creating a table, which you then easily convert to other visualizations, to find one that best illustrates your Data.

Step 1: Under the **Power View Fields**, select the fields you want to visualize.

Step 2: By default, the **Table** View will be displayed. As you move across the Table, on the top-right corner, you find two symbols – Filters and Pop out.

Step 3: Click on the **Filters** symbol. The filters will be displayed on the right side. **Filters** has two tabs. View tab to filter all visualizations in this **View** and **Table** tab to filter the specific values in this table only.

The screenshot shows the Microsoft Excel ribbon with the 'POWER VIEW' tab selected. To the right, the 'Power View Fields' pane is open. The 'ACTIVE' tab is selected, showing checkboxes for fields: Alpha-2 Code, City, Edition, EditionID, NOC_CountryRegion, and Season. There are also sections for 'VIEW BY' and 'FIELDS' where these fields are listed. Arrows point from the text labels to the corresponding elements in the interface.

Labels in the screenshot:

- Filters
- Pop out
- Table View
- View
- Filters
- Power View Fields
- ACTIVE
- Alpha-2 Code
- City
- Edition
- EditionID
- NOC_CountryRegion
- Season
- VIEW BY
- FIELDS
- City
- NOC_CountryRegion
- Edition
- Season

Visualization – Matrix

A **Matrix** is made up of rows and columns like a **Table**. However, a Matrix has the following capabilities that a Table does not have:

- Display data without repeating values.
- Display totals and subtotals by row and column.
- With a hierarchy, you can drill up/drill down.

Collapse and Expand the Display

Step 1: Click on the **DESIGN** tab.

Step 2: Click on **Table** in the **Switch Visualization Group**.

Step 3: Click on **Matrix**.

City	NOC_CountryRegion	Edition	Season
Altenville	FRA	1992	Winter
Amsterdam	NED	1928	Summer
Anwerp	BEL	1920	Summer
Antwerp	BEL	1920	Winter
Athens	GRC	2004	Summer
Atlanta	USA	1996	Summer
Barcelona	ESP	1992	Summer
Beijing	CHN	2008	Summer
Berlin	GER	1936	Summer
Calgary	CAN	1988	Winter
Chamonix	FRA	1924	Winter
Cortina d'Ampezzo	ITA	1956	Winter
Garmisch-Partenkirchen	GER	1936	Winter
Grenoble	FRA	1968	Winter
Helsinki	FIN	1952	Summer
Jeanneville	AFR	2008	Summer

The **Matrix Visualization** appears.

Matrix Visualization

City	NOC_CountryRegion	Edition	Season
Albertville	FRA	Winter	1992
		Total	1992
Amsterdam	NED	Summer	1928
		Total	1928
Antwerp	BEL	Summer	1920
		Winter	1920
		Total	3840
Athens	GRC	Summer	2004
		Total	2004

Visualization – Card

You can convert a **Table** to a series of **Cards** that display the data from **each row** in the table laid out in a **Card format**, like an **index Card**.

Step 1: Click on the **DESIGN** tab.

Step 2: Click on **Table** in the **Switch Visualization Group**.

Step 3: Click on **Card**.

Card

Switch Visualization Group

Design tab

City	NOC_CountryRegion	Edition	Season
Albertville	FRA	1992	Winter
Amsterdam	NED	1928	Summer
Antwerp	BEL	1920	Summer
Antwerp	BEL	1920	Winter
Athens	GRC	2004	Summer
Atlanta	USA	1996	Summer
Barcelona	ESP	1992	Summer
Beijing	CHN	2008	Summer
Berlin	GER	1936	Summer
Calgary	CAN	1988	Winter
Chamonix	FRA	1924	Winter
Cortina d'Ampezzo	ITA	1956	Winter
Garmisch-Partenkirchen	GER	1936	Winter
Grenoble	FRA	1968	Winter
Helsinki	FIN	1952	Summer

The **Card Visualization** appears.

The screenshot shows the Microsoft Excel ribbon with the 'POWER VIEW' tab selected. A card visualization titled 'Hosts' is displayed, listing various host cities with their details: Turin (ITA, 2006 Winter), Tokyo (JPN, 1964 Summer), Sydney (AUS, 2000 Summer), Stockholm (SWE, 1912 Summer), St. Moritz (SUI, 1924 Winter), St. Louis (USA, 1904 Summer), Squaw Valley (USA, 1980 Winter), Seoul (KOR, 1988 Summer), Sarajevo (YUG, 1984 Winter), and Sapporo (JPN, 1972 Winter). To the right of the card is a 'Filters' pane and a 'Power View Fields' pane. The 'Power View Fields' pane shows fields like Alpha-2 Code, City, Edition, EditionID, NOC_CountryRegion, and Season, with 'City' and 'Edition' checked. An arrow points to the card visualization with the label 'Card Visualization'.

Visualization – Charts

In **Power View**, you have a number of Chart options: Pie, Column, Bar, Line, Scatter, and Bubble. You can use several design options in a chart such as showing and hiding labels, legends, and titles.

Charts are interactive. If you click on a Value in one Chart:

- the **Value** in that chart is highlighted.
- All the Tables, Matrices, and Tiles in the report are filtered to that Value.
- That **Value** in all the other Charts in the report is highlighted.

The charts are interactive in a presentation setting also.

Step 1: Create a **Table Visualization** from **Medals** data.

You can use Line, Bar and Column Charts for comparing data points in one or more data series. In these Charts, the x-axis displays one field and the y-axis displays another, making it easy to see the relationship between the two values for all the items in the Chart.

Line Charts distribute category data evenly along a horizontal (category) axis, and all numerical value data along a vertical (value) axis.

Step 2: Create a Table Visualization for two Columns, **NOC_CountryRegion** and **Count of Medal**.

Step 3: Create the same Table Visualization below.

Table Visualization

Table Visualization

Step 4: Click on the **Table Visualization** below.

Step 5: Click on **Other Chart** in the **Switch Visualization** group.

Step 6: Click on **Line**.

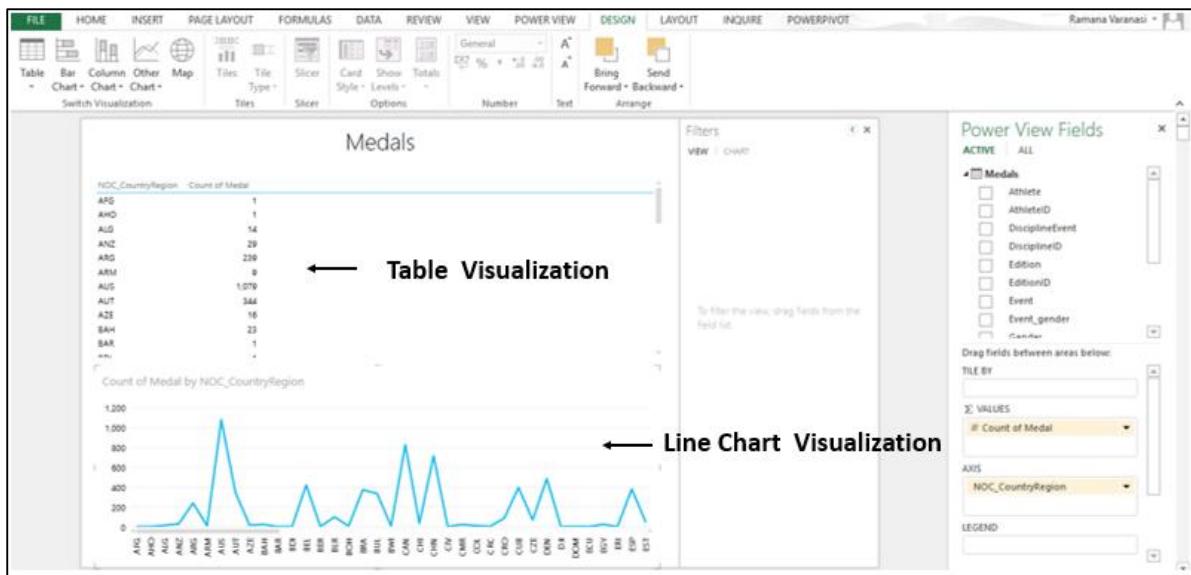
Switch Visualization Group

Line

Table Visualization

Table Visualization

The **Table Visualization** converts into **Line Chart Visualization**.

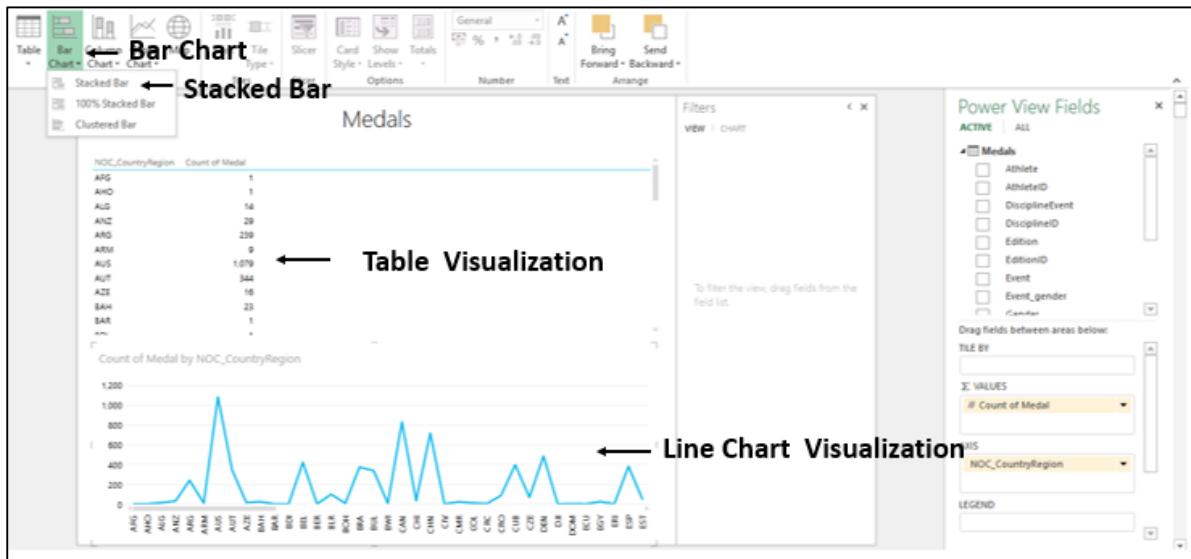


In a **Bar Chart**, categories are organized along the vertical axis and values along the horizontal axis. In **Power View**, there are three subtypes of the **Bar Chart**: **Stacked**, **100% stacked**, and **Clustered**.

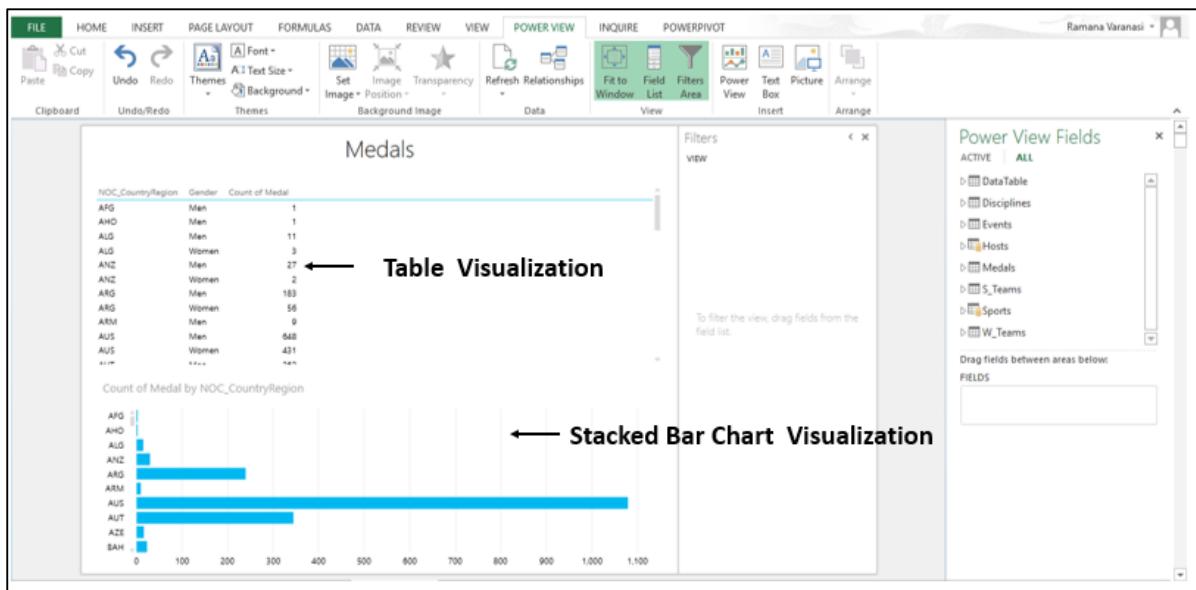
Step 7: Click on the **Line Chart Visualization**.

Step 8: Click on **Bar Chart** in the **Switch Visualization** Group.

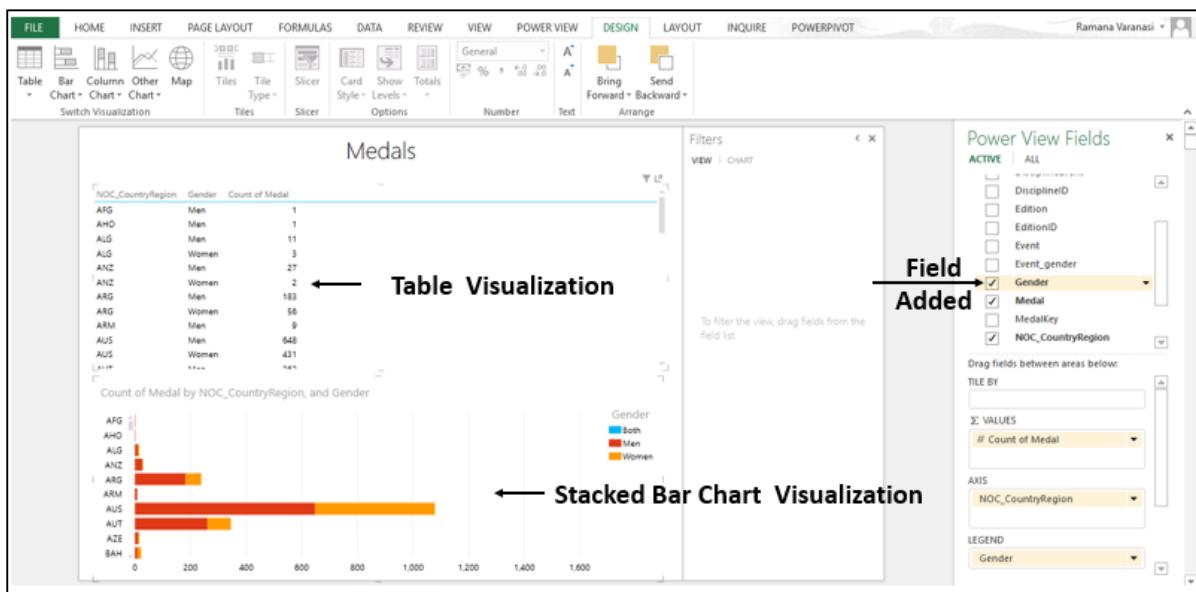
Step 9: Click on the **Stacked Bar** option.



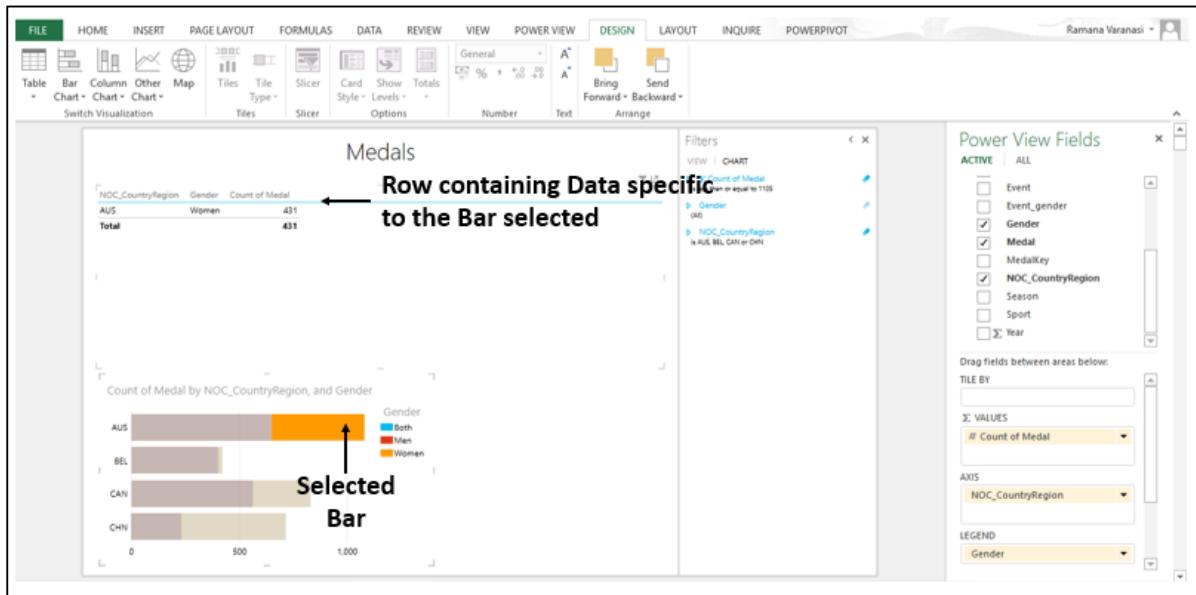
The **Line Chart Visualization** converts into **Stacked Bar Chart Visualization**.



Step 10: In the **Power View Fields**, in the **Medals** Table, select the **Field Gender** also.



Step 11: Click on one of the bars. That portion of the bar is highlighted. Only the row containing the Data specific to the selected bar is displayed in the table above.



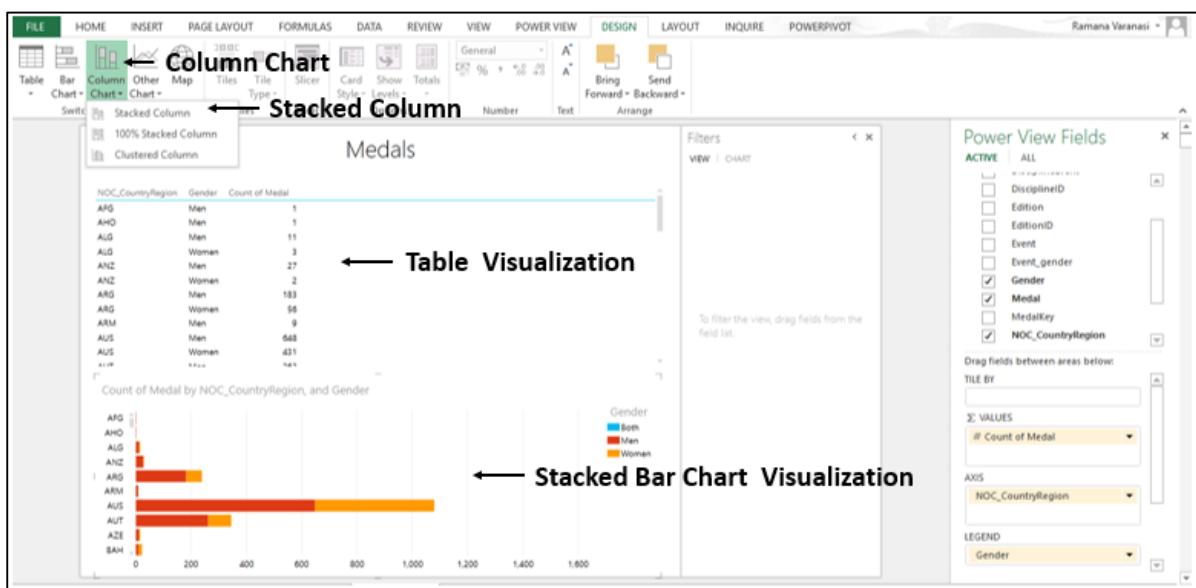
You can use the column charts for showing data changes over a period of time or for illustrating comparison among different items. In a Column Chart, the categories are along the horizontal axis and values are along the vertical axis.

In Power View, there are three **Column Chart** subtypes: **Stacked**, **100% stacked**, and **Clustered**.

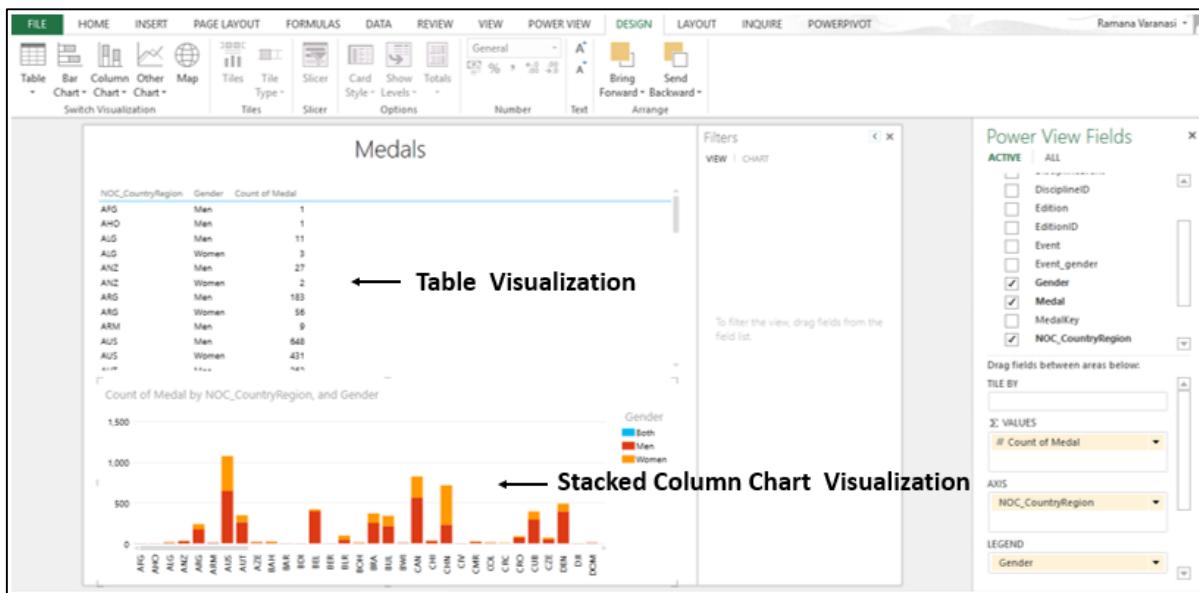
Step 12: Click on the **Stacked Bar Chart Visualization**.

Step 13: Click on Column Chart in the **Switch Visualization** group.

Step 14: Click on **Stacked Column**.



The **Stacked Bar Chart** Visualization converts into **Stacked Column Chart** Visualization.



18. Excel – Pie Charts

You can have simple **Pie Chart Visualizations** in Power View.

Step 1: Click on the **Table Visualization** as shown below.

Step 2: Click on **Other Chart** in the **Switch Visualization** group.

Step 3: Click on **Pie** as shown in the image given below.

The screenshot shows the Microsoft Excel ribbon with the Power View tab selected. In the center, there is a table visualization titled "Medals" showing medal counts by country. To the left of the table, the "Switch Visualization" group is expanded, and the "Other Chart" button is highlighted with an arrow. Below the table, another table visualization is shown with the same data. To the right, the "Power View Fields" pane is open, showing fields like NOC_CountryRegion and Count of Medal. The "Filters" pane shows a filter for NOC_CountryRegion being AUS, CAN, CHN or BEL. The "Fields" section also lists NOC_CountryRegion and Count of Medal.

The **Table Visualization** converts into **Pie Chart Visualization**.

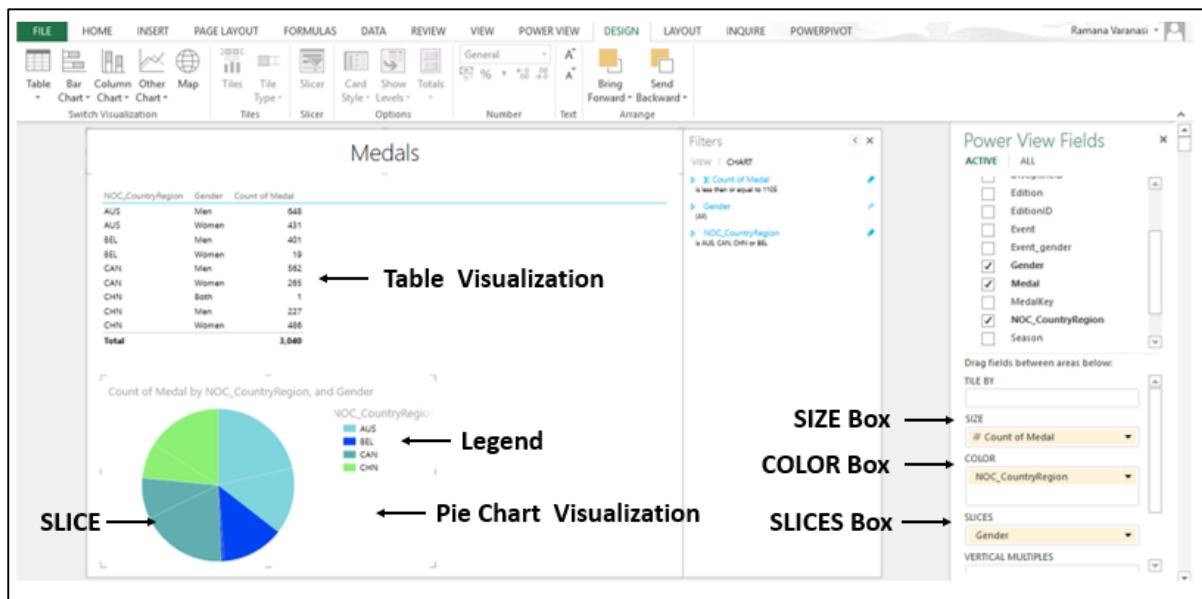
The screenshot shows the Microsoft Excel ribbon with the Power View tab selected. The central area displays the "Medals" table visualization. To its right is a pie chart visualization titled "Count of Medal by NOC_CountryRegion". The pie chart has three segments: AUS (light blue), BEL (dark blue), and CHN (green). A legend below the pie chart identifies the countries by color. Arrows point from the text labels "Legend" and "Pie Chart Visualization" to their respective parts. On the far right, the "Power View Fields" pane is open, with the "SIZE" box set to "# Count of Medal" and the "COLOR" box set to "NOC_CountryRegion". Other settings like "SLICES" and "VERTICAL MULTIPLES" are visible at the bottom.

You now have a **Simple Pie Chart Visualization** wherein the **count** of Medals are shown by the **Pie Size**, and Countries by **Colors**. You can also make your **Pie Chart Visualization** sophisticated by adding more features. One such example is **SLICES**.

Step 1: Add **Field Gender** to the **Table** above.

Step 2: Click on **Pie Chart Visualization**.

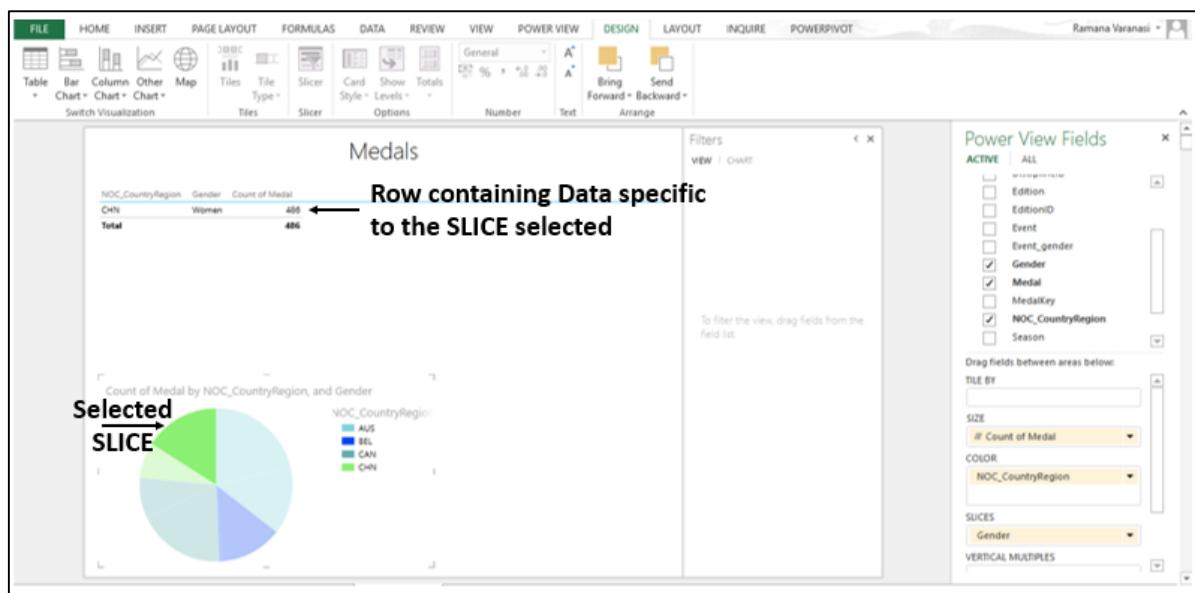
Step 3: Drag **Field Gender** in the **Power View Fields List** to the **SLICES Box** as shown below.



Now, with **SLICES**, you can visualize the count of Medals for men and for women in each country.

Step 4: Click on a **SLICE** in the **Pie Chart Visualization**.

Step 5: Only the specific row containing the data specific to the **SLICE** will be displayed in the **TABLE VISUALIZATION** above.



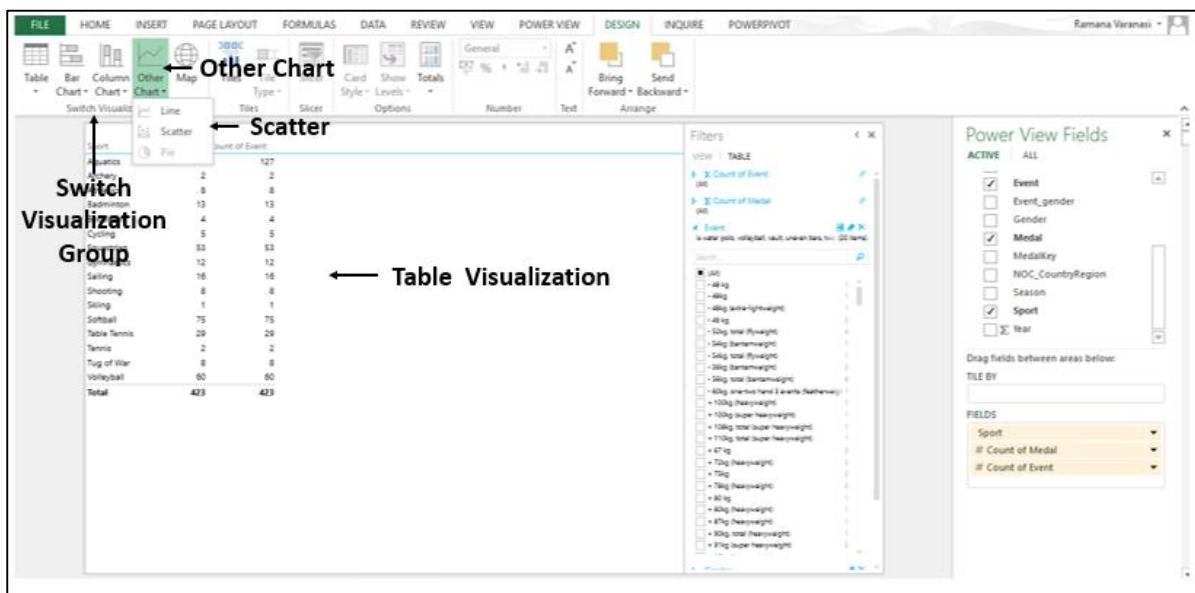
Bubble and Scatter Charts

You can use the **Bubble and Scatter** charts to display many related data in one chart. In Scatter charts, the x-axis displays one numeric field and the y-axis displays another, making it easy to see the relationship between the two values for all the items in the chart. In a Bubble Chart, a third numeric field controls the size of the data points.

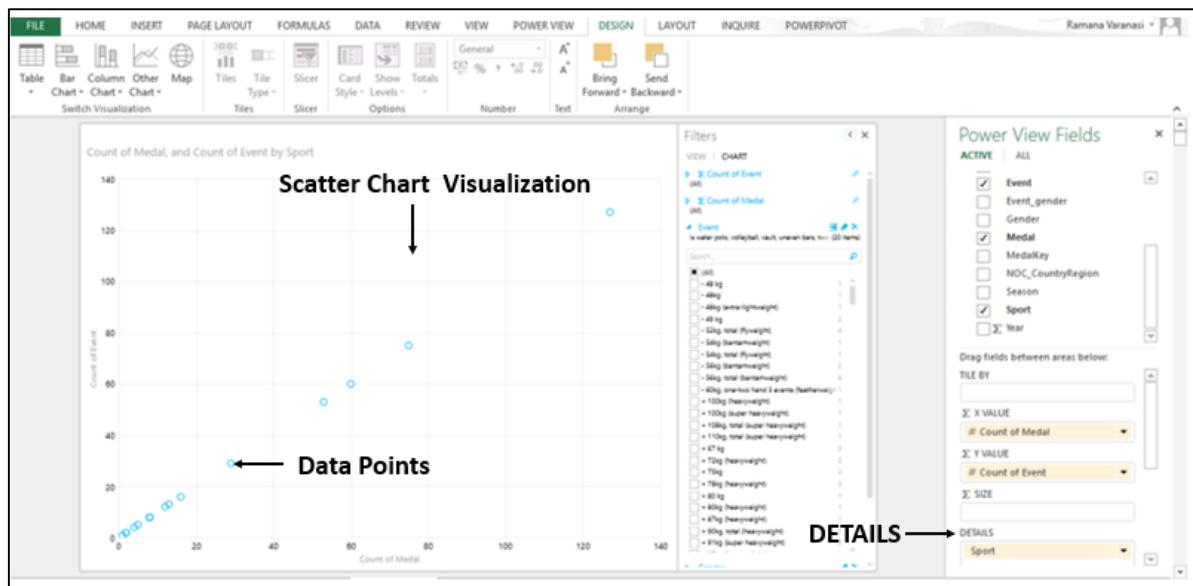
Step 1: Add one Category Field and one Numeric Field to the **Table**.

Step 2: Click on **Other Chart** in the **Switch Visualization** group.

Step 3: Click on **Scatter**.



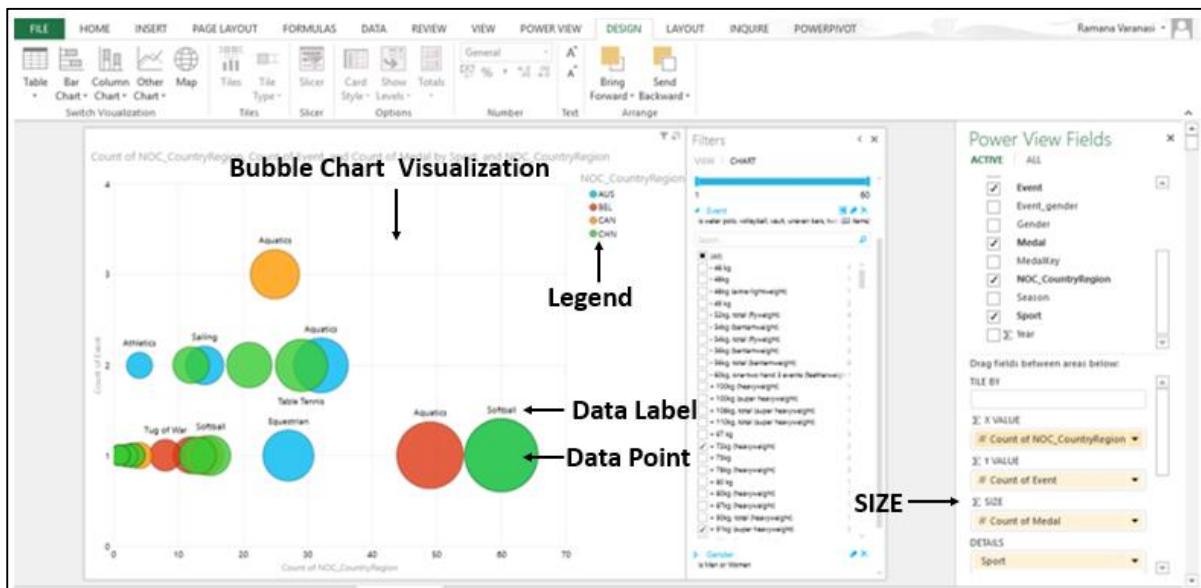
The **Table Visualization** converts into **Scatter Chart Visualization**. The Data points are little circles and all are of same size and same color. Category is in DETAILS Box.



Step 4: Drag **Medal** to **Size**.

Step 5: Drag field **NOC_CountryRegion** to Σ **X VALUE**.

The **Scatter Chart Visualization** converts into **Bubble Chart Visualization**. The data points are circles of the size represented by the values of Data points. The color of the circles is the **X VALUE** and given in the **Legend**. The data labels are the **Category Values**.

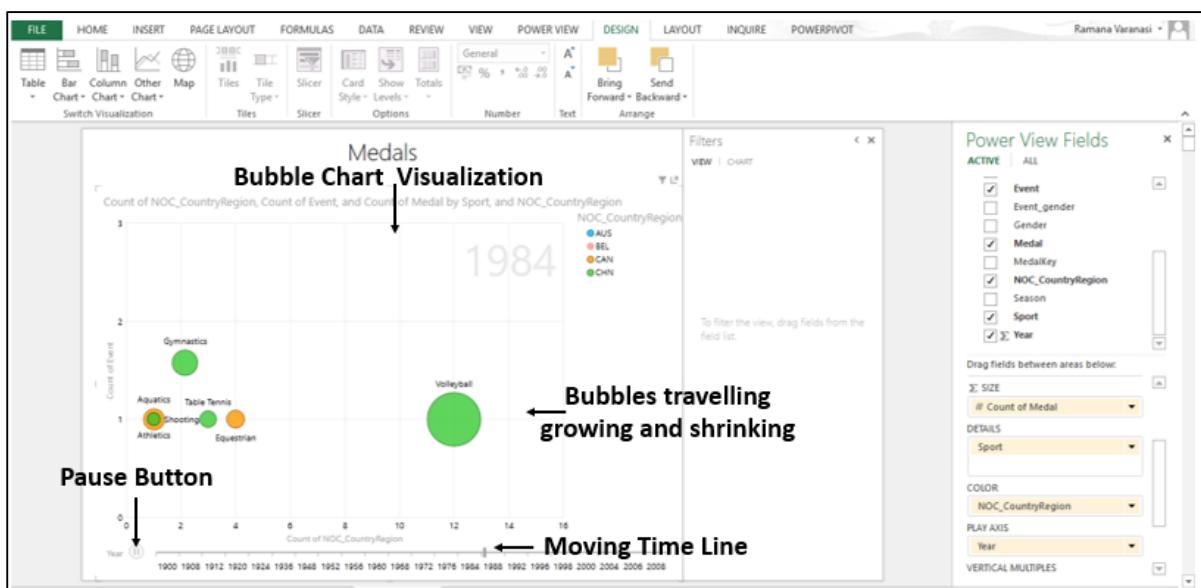


Step 6: Drag the field **NOC_CountryRegion** to the **COLOR** Box. The bubbles will be colored by the values of the field in the **COLOR** box.

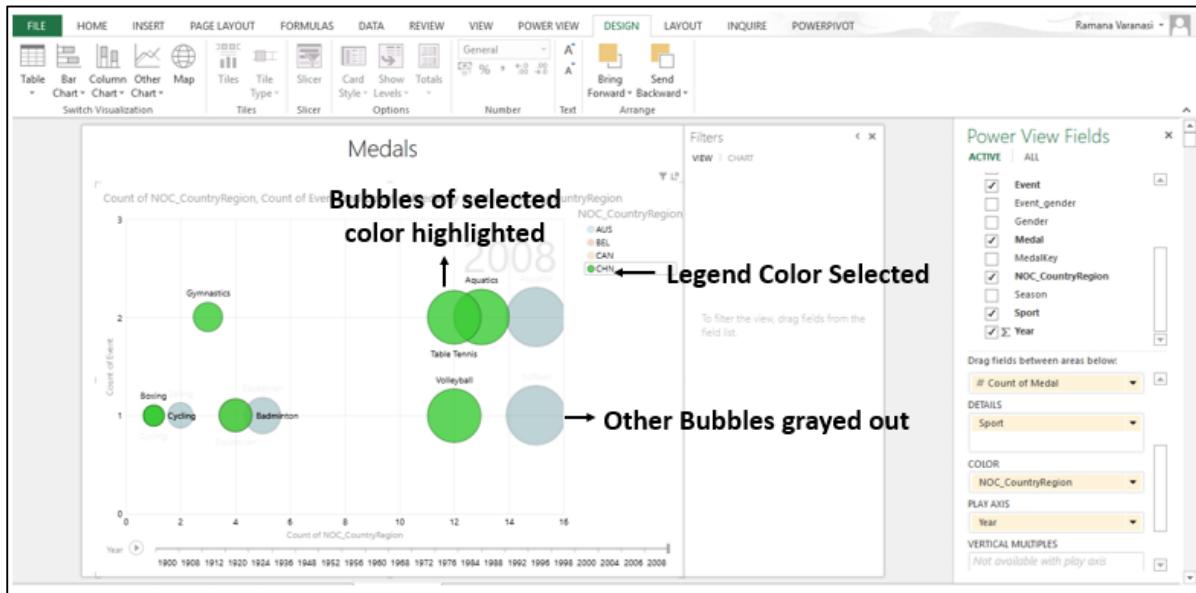
Step 7: Drag the **Year** field to **PLAY AXIS**. A Time Line with **Play** button will be displayed below the Bubble Chart Visualization.



Step 8: Click on the **Play** button. The bubbles travel, grow, and shrink to show how the values change based on the **PLAY AXIS**. You can pause at any point to study the data in more detail.



Step 9: Click any color on the **Legend**. All the bubbles of that color will be highlighted and other bubbles will be grayed out.

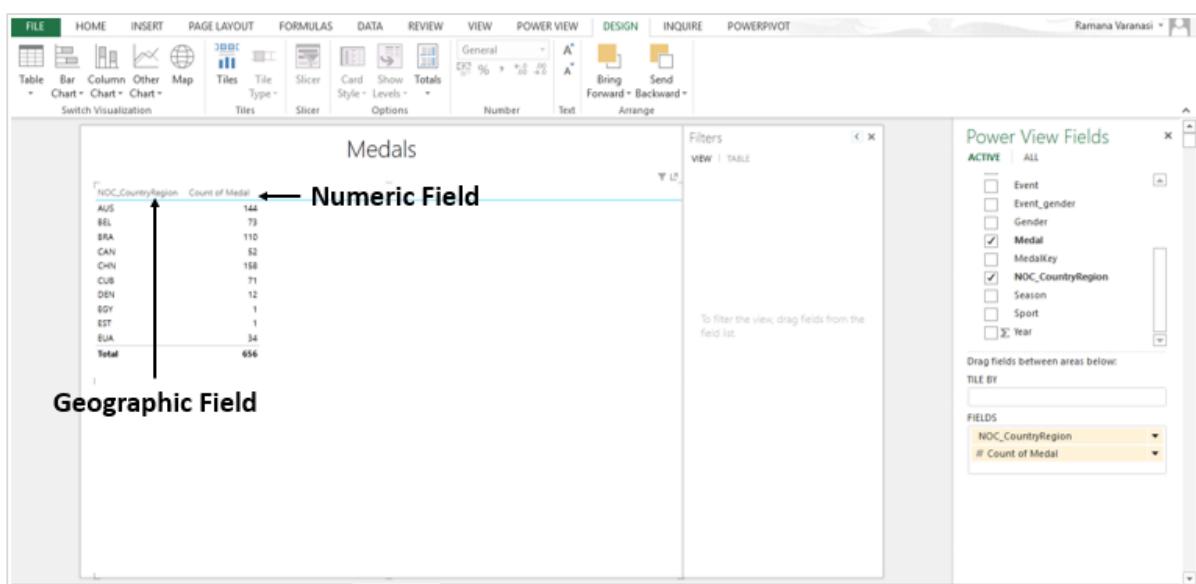


Maps

You can use **Maps** to display your data in the context of geography. Maps in Power View use Bing map tiles, so you can zoom and pan as you would with any other **Bing map**. To make **maps** work, **Power View** has to send the **data** to **Bing** through a secured web connection for geocoding. So, it asks you to enable the content. Adding locations and fields places dots on the map. The larger the value, the bigger the dot. When you add a multi-value series, you get pie charts on the map, with the size of the pie chart showing the size of the total.

Step 1: Drag a **Geographic Field** such as Country/Region, State/Province, or City from **Power View Fields List** to the table.

Step 2: Drag a numeric field such as **Count** to the table.



Step 3: Click on **DESIGN** tab on the ribbon.

Step 4: Click on **Map** in the **Switch Visualization** group.

The screenshot shows the Microsoft Excel ribbon with the DESIGN tab selected. In the Switch Visualization group, the 'Map' icon is highlighted. The main area displays a table titled 'Medals' with data for various countries. An arrow points from the text 'Table Visualization' to the table. To the right, the Power View Fields pane is open, showing fields like Event, Medal, and NOC_CountryRegion. A dot is placed over Australia on a world map. An arrow points from the text 'Map Visualization' to the map. Another arrow points from the text 'Geographic Location, Numeric Value (size of the Dot)' to the dot on the map.

NOC_CountryRegion	Count of Medal
AUS	144
BEL	79
BRA	110
CAN	52
CHN	198
CUB	71
DEU	12
EST	1
EUA	34
Total	656

The **Table Visualization** converts into **Map Visualization**. **Power View** creates a map with a dot for every geographic location. The size of the dot is the value of the corresponding numeric field.

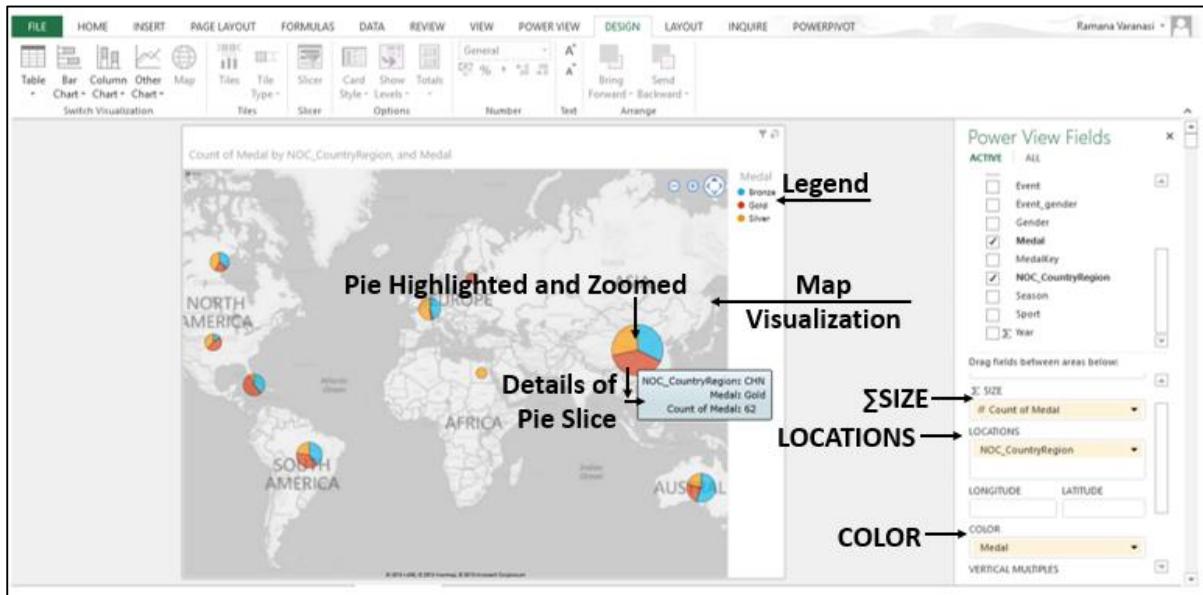
Step 5: Click on a dot. The data, viz., the geographic location and the numeric information relating to the size of the dot will be displayed.

The screenshot shows the Microsoft Excel ribbon with the DESIGN tab selected. In the Switch Visualization group, the 'Map' icon is highlighted. The main area displays a world map where each country is represented by a blue dot. An arrow points from the text 'Map Visualization' to the map. A specific dot is highlighted over Australia. A tooltip appears below the dot, showing 'NOC_CountryRegion: AUS Count of Medals: 144'. Another arrow points from the text 'Geographic Location, Numeric Value (size of the Dot)' to the tooltip. The Power View Fields pane is visible on the right, showing fields like Event, Medal, and NOC_CountryRegion.

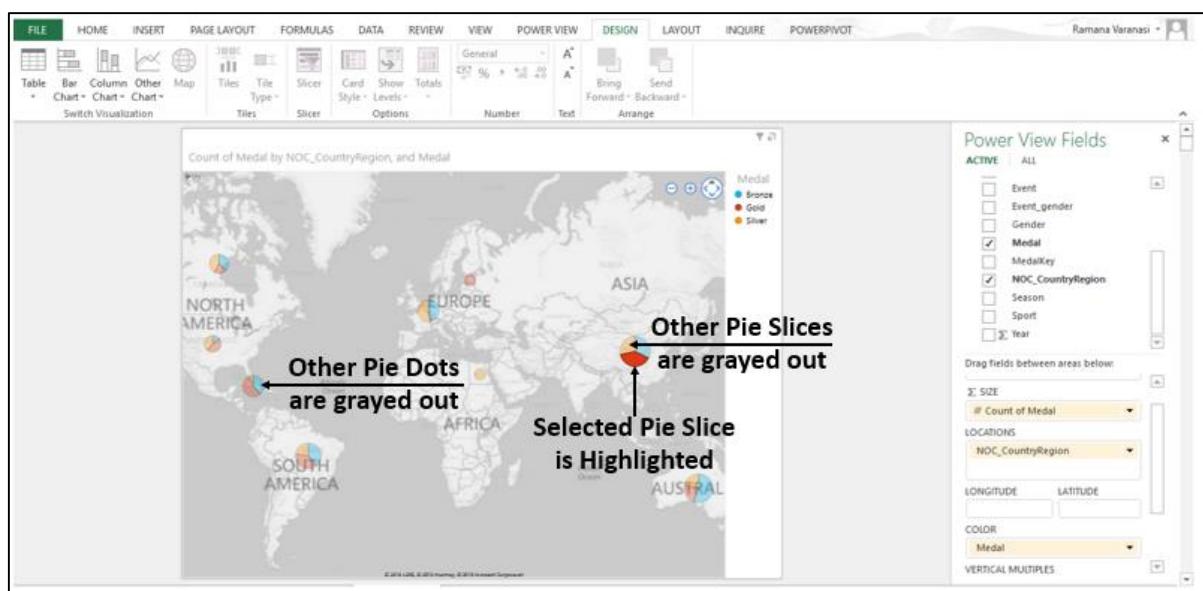
Step 6: You can also verify that below the **Power View Fields List**, the Geographic field is in the **Locations** Box and Numeric Field is in the **Σ SIZE** Box.

Step 7: Drag Medal to **COLOR** Box. The **Dots** are converted into **Pie Charts**. Each **Color** in the **Pie** representing the **category** of the Medals.

Step 8: Place the **cursor** on one of the **Dots**. The **Dot** gets highlighted and zoomed. The details of the **Pie Slice** are displayed.



Step 9: Place the cursor on one of the **Dots** and click on it. That **Pie Slice** is **highlighted**. The other **Slices** in the **Pie** and all **other Pie Dots** will **gray out**.



Multiples: A Set of Charts with the Same Axes

Multiples are a **series** of **charts** with **identical X and Y axes**. You can have **Multiples** arranged side by side, making it easy to compare many different values at the same time. **Multiples** are also called **Trellis Charts**.

Step 1: Start with a **Pie Chart**. Click on the **Pie Chart**.

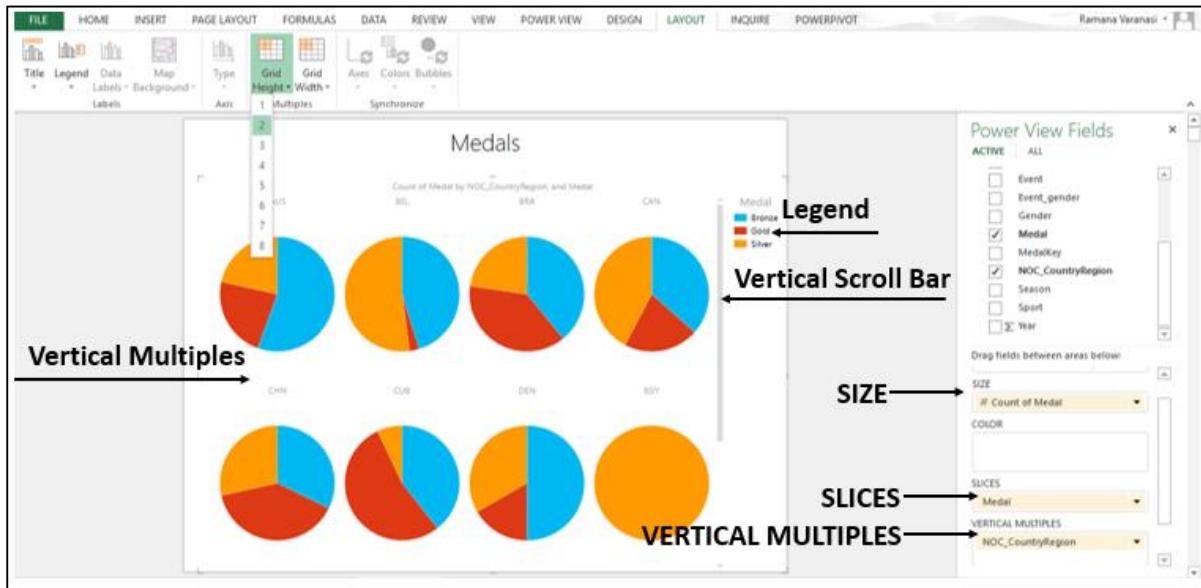
Step 2: Drag a **Field** to **Vertical Multiples**.

Step 3: Click on the **LAYOUT tab** on the ribbon.

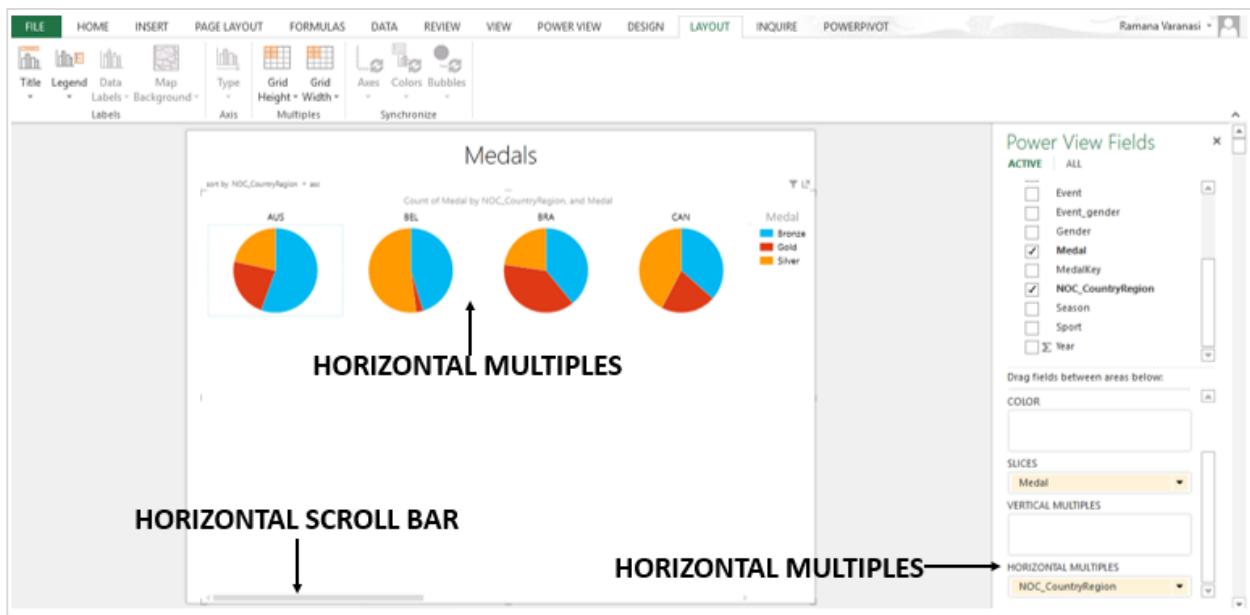
Step 4: Click on **Grid Height** and select a number.

Step 5: Click on **Grid Width** and select a number.

Vertical Multiples expand across the available page width and then wrap down the page into the space available. If all the multiples do not fit in the available space, you get a vertical scroll bar.



Step 6: Drag the field in **VERTICAL MULTIPLES** to **HORIZONTAL MULTIPLES**. The horizontal multiples expand across the page. If all the multiples do not fit in the page width, you get a horizontal scroll bar.

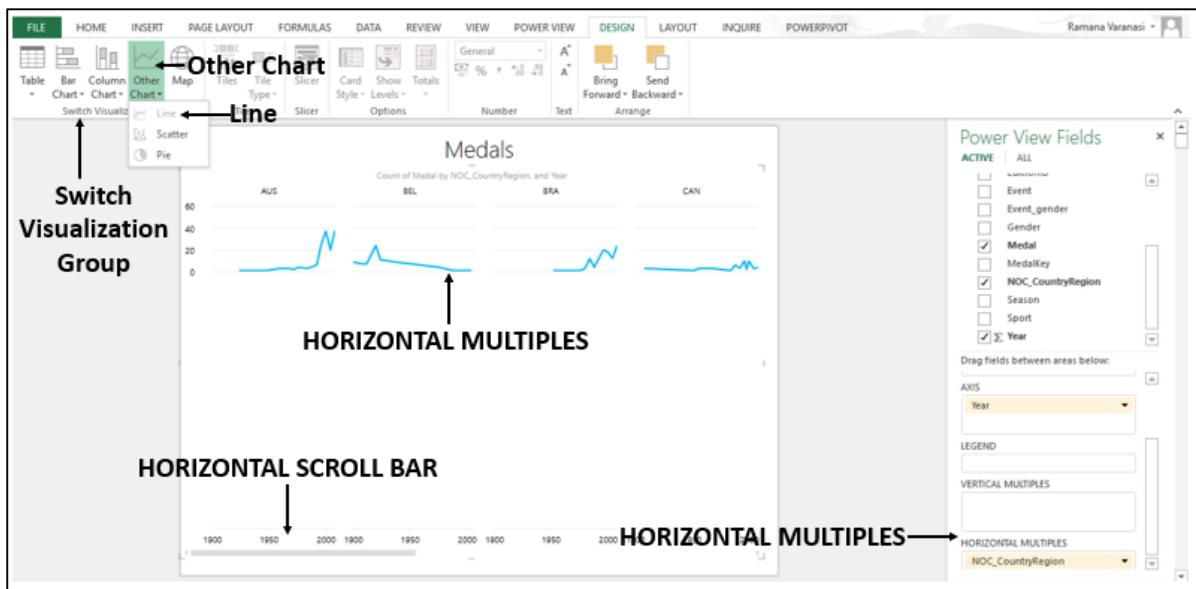


Step 7: Click on **Multiples**.

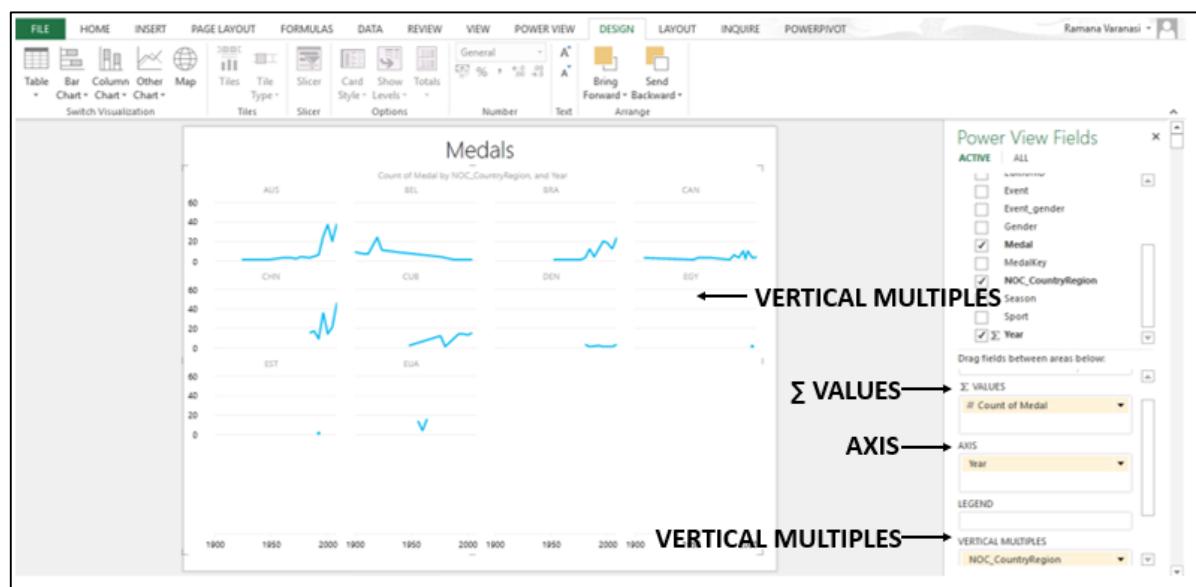
Step 8: Click on the **DESIGN** tab on the ribbon.

Step 9: Click on **Other Chart** in the **Switch Visualization** group.

Step 10: Click on **Line**. You have created Horizontal Multiples of the Line charts.



Step 11: Drag the Field in **HORIZONTAL MULTIPLES** to **VERTICAL MULTIPLES**. You have created VERTICAL MULTIPLES of Line Charts.

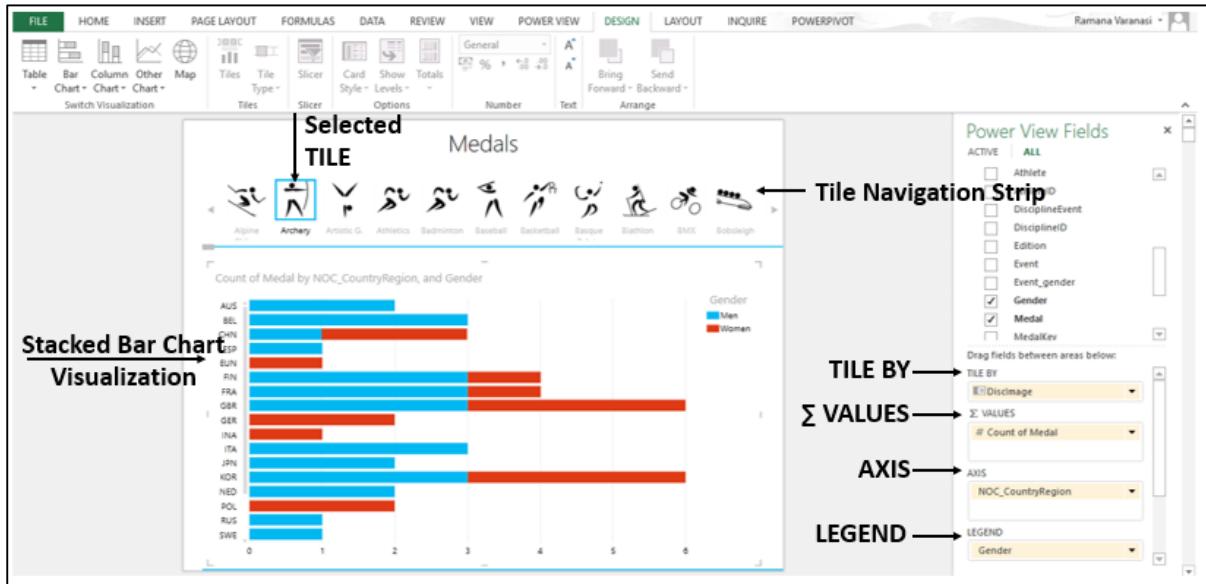


Visualization – Tiles

Tiles are containers with a dynamic navigation strip. You can convert a Table, Matrix or Chart to Tiles to present data interactively. Tiles filter the content inside the Tile to the value selected in the Tab Strip. You can have a single Tile for each possible field value so that if you click on that Tile, data specific to that Field is displayed.

Step 1: Drag the **Field** you want to use as your **Tile** from the **Fields List** and drop it in the **Tile by** box. The **Tile Navigation Strip** displays the **Values** for that **Field**.

Step 2: Click the **Tiles** to move between the data for different Tiles. The data changes in the **Stacked Bar Chart Visualization** according to the selected Tile. All the content in the container is filtered by the selected Tile value.



The Tile container has two navigation strip types: **tile flow and tab strip**.

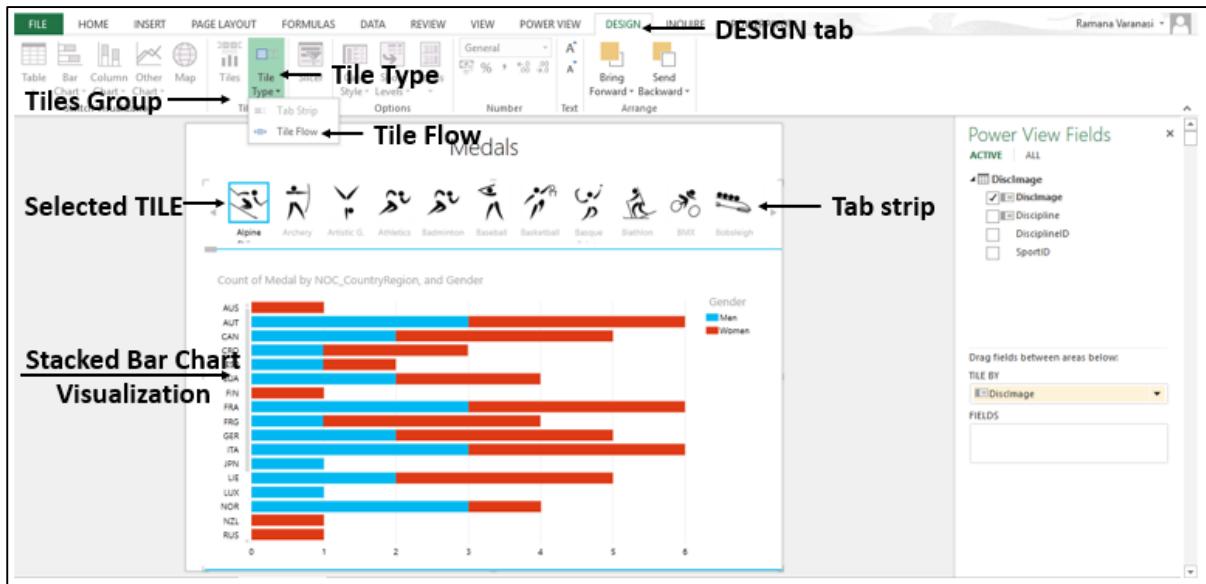
What you have created above is the **tab strip**. Tab strip displays the navigation strip across the top of the visualization.

Step 3: Click on a Tile.

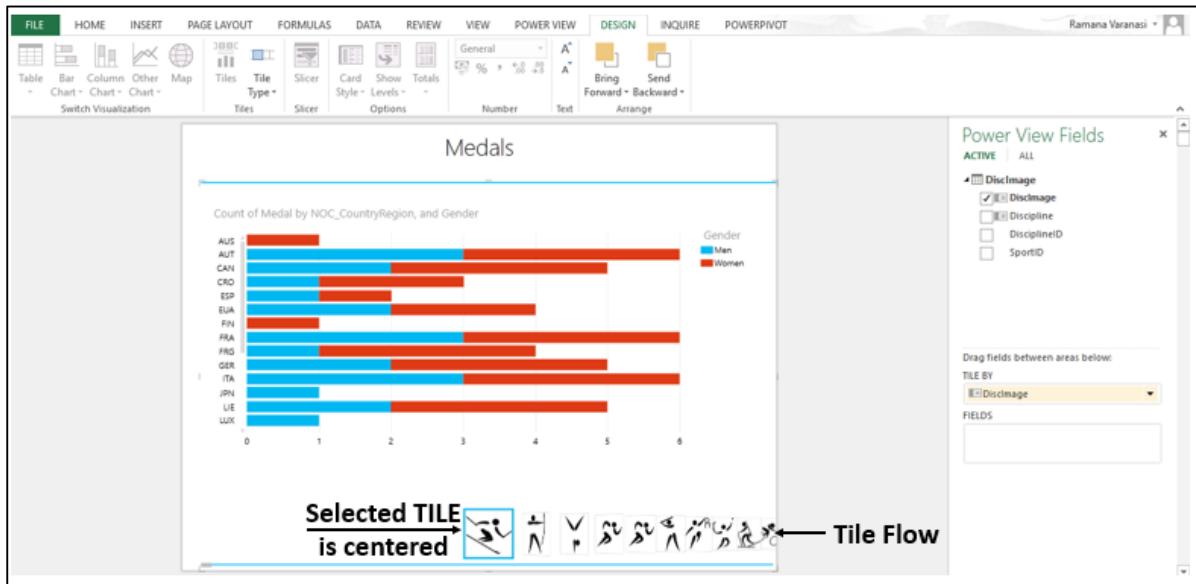
Step 4: Click on the **DESIGN** tab on the ribbon.

Step 5: Click on **Tile Type** in the **Tiles** group.

Step 6: Click on **Tile Flow**.



The **Tile flow** displays the navigation strip across the bottom of the Visualization. The selected Tile is always centered.

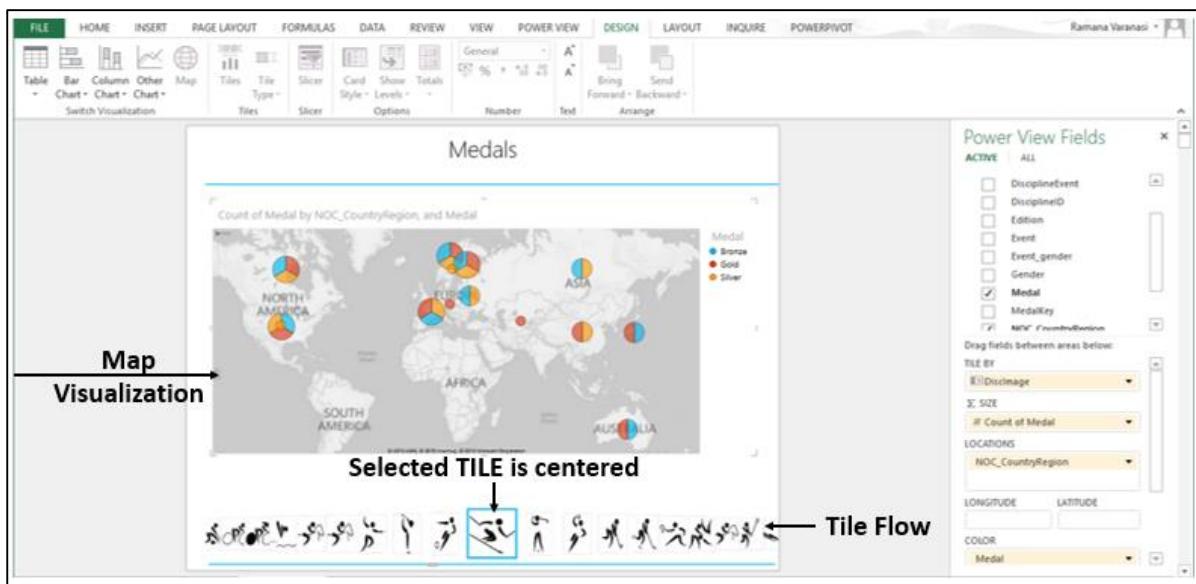


You can click on the **Tiles** or you can **Scroll** through the **Tiles** by using the **Scroll Bar**. When you **Scroll**, the **Tiles** go on being **selected**.

Step 7: Click on **Map** in the **Switch Visualization** group.

Step 8: Drag Medal to **Color**.

Step 9: De-select the **Field** Gender.



You got **Map Visualization** with **Tile Flow**. Likewise, you can have any data visualization with Tiles.

19. Power View – Additional Features

Power View in Excel 2013 provides an interactive data exploration, visualization, and presentation experience for all skill levels as you have seen in the previous section. You can pull your data together in Tables, Matrices, Maps, and a variety of Charts in an Interactive View that brings your Data to life. New features have been added to Power View in Excel 2013.

You can also publish Excel workbooks with Power View sheets to **Power BI**. **Power BI** saves the Power View sheets in your workbook as a Power BI report.

Power View sheets can connect to different data models in one workbook.

In Excel 2013, a workbook can contain:

- An internal Data Model that you can modify in Excel, in Power Pivot, and even in a Power View sheet in Excel.
- Only one internal Data Model, and you can base a Power View sheet on the Data Model in that workbook or on an external data source.
- Multiple Power View sheets, and each of the sheets can be based on a different data model.

Each Power View sheet has its own Charts, Tables, and other Visualizations. You can copy and paste a chart or other visualization from one sheet to another, but only if both sheets are based on the same Data Model.

Modify the internal Data Model

You can create Power View sheets and an internal Data Model in an Excel 2013 workbook. If you base your Power View sheet on the internal Data Model, you can make some changes to the Data Model while you are in the Power View sheet itself.

Step 1: Select the worksheet **Salesperson**.

Salesperson	Salesperson ID
Albertson, Kathy	AlKaSal001
Brennan, Michael	BrMiSal002
Davis, William	DaWiSal003
Dumlao, Richard	DuRiSal004
Flores, Tia	FITiSal005
Post, Melissa	PoMeSal006
Thompson, Shannon	ThShSal007
Walters, Chris	WaChSal008

You have a **Range of Data** of Salesperson and Salesperson ID.

Step 2: Now select the Worksheet **Sales**. You have a **Range of Data** of Sales.

Salesperson ID	Region	Month	Account	Order Amount
AlKaSal001	East	January	29386	\$925.00
AlKaSal001	East	February	74830	\$875.00
AlKaSal001	East	February	90099	\$500.00
AlKaSal001	East	March	74830	\$350.00
BrMiSal002	West	January	82853	\$400.00
BrMiSal002	West	January	72949	\$850.00
BrMiSal002	West	January	90044	\$1,500.00
BrMiSal002	West	February	82853	\$550.00
BrMiSal002	West	February	72949	\$400.00
DaWiSal003	South	February	55223	\$235.00
DaWiSal003	South	January	10354	\$850.00
DaWiSal003	South	March	50192	\$600.00
DaWiSal003	South	January	27589	\$250.00
DuRiSal004	West	January	67275	\$400.00
DuRiSal004	West	February	41828	\$965.00
DuRiSal004	West	March	87543	\$125.00
FITiSal005	South	March	97446	\$1,500.00
FITiSal005	South	January	41400	\$305.00
FITiSal005	South	January	30974	\$1,350.00
FITiSal005	South	February	41400	\$435.00
FITiSal005	South	February	30974	\$550.00

Step 3: Convert the data in the worksheet **Salesperson** to table and name it **Salesperson**.

Step 4: Convert the data on the Sales Worksheet to table and name it **Sales**. Now, you have two tables in two Worksheets in the Workbook.

Step 5: Click on the **Sales** Worksheet.

Step 6: Click on the **INSERT** tab on the ribbon.

Step 7: Click on **Power View**.

The screenshot shows the Microsoft Excel ribbon with the "POWERVIEW" tab selected. On the left, there is a "Sales" table with columns: Salesperson ID, Region, Month, Account, and Order Amount. The "Power View" ribbon tab is highlighted with a callout arrow.

Power View sheet is created in the Workbook. In the **Power View Fields** list, you can find both the tables that are available in the Workbook. However, in the Power View, only the Active Table (Sales) Fields are displayed since only the active Data Table Fields are selected in the Fields List.

The screenshot shows the Microsoft Excel ribbon with the "POWERVIEW" tab selected. The "Power View Fields" pane is open, showing the "Active Data Table" (Sales) and "Other Data Table" (Salesperson). The Sales table is displayed below the pane.

In the **Power View**, Salesperson ID is displayed. Suppose, instead you want to display the names of the salespersons.

Step 8: De-select the **Field** Salesperson ID in **Power View Fields**.

The screenshot shows the Microsoft Excel ribbon with the Power View tab selected. A table of sales data is visible in the main area. To the right is the 'Power View Fields' pane. In the 'ACTIVE' section, 'Sales' is selected. Under 'Fields', 'Region', 'Month', 'Account', and 'Order Amount' are listed with radio buttons next to them. Below this, a list of fields is shown with checkboxes: 'Account' (checked), 'Month' (checked), 'Order Amount' (checked), 'Region' (unchecked), 'Salesperson' (unchecked), and 'Salesperson ID' (unchecked). Annotations include arrows pointing to the 'Region' field in the table and the 'Region' field in the Power View Fields pane, both labeled 'Field unselected'. Another annotation points to the 'Salesperson' field in the Power View Fields pane with the text 'Unselected Field Column not displayed'.

Step 9: Select the Field **Salesperson** in the Table **Salesperson** in Power View Fields.

You do not have a Data Model in the Workbook and hence no relationship exists between the two tables. Excel does not display any Data and displays messages directing you what to do.

The screenshot shows the Microsoft Excel ribbon with the Power View tab selected. A table of sales data is visible in the main area. To the right is the 'Power View Fields' pane. A message box in the center says 'Relationships between tables may be needed' with a 'CREATE...' button. Annotations include: 'Not showing data because it's not clear how these fields are related' with an arrow pointing to the message; 'This table contains no rows.' with an arrow pointing to the table; and 'Field selected' with an arrow pointing to the 'Salesperson' field in the Power View Fields pane, which has a checked checkbox.

Step 10: Click on the **CREATE** button. The **Create Relationship** Dialog Box opens in the Power View sheet itself.

The screenshot shows the Microsoft Excel ribbon at the top. A 'Create Relationship' dialog box is open in the center, prompting the user to pick tables and columns for a relationship. The 'Table' dropdown is set to 'Sales' and the 'Related Table' dropdown is set to 'Salesperson'. Both dropdowns have 'Salesperson ID' selected as the column for the relationship. Below the dropdowns, it says 'Creating relationships between tables is necessary to show related data from different tables on the same report.' At the bottom of the dialog box are 'Manage Relationships...', 'OK', and 'Cancel' buttons. To the right of the dialog box is the 'Power View Fields' pane, which displays various relationships and fields from the Sales and Salesperson tables. The 'ACTIVE' tab is selected. The 'TILE BY' section shows 'Region', 'Month', 'Account', and 'Σ Order Amount' as tiles. The 'FIELDS' section also lists 'Region', 'Month', 'Account', and 'Σ Order Amount'. The 'Salesperson' field is highlighted in yellow. The status bar at the bottom of the screen shows 'Power View Sheet'.

Step 11: Create the relationship between the two tables using the **Salesperson ID** Field.

The screenshot shows the Microsoft Excel ribbon at the top. A table of sales data is visible in the main area, with the 'Salesperson' field highlighted in yellow and labeled 'Field displayed'. To the right is the 'Power View Fields' pane, which lists fields from the Sales and Salesperson tables. The 'ACTIVE' tab is selected. The 'TILE BY' section shows 'Region', 'Month', 'Account', and 'Σ Order Amount' as tiles. The 'FIELDS' section lists 'Salesperson', 'Region', 'Month', 'Account', and 'Σ Order Amount'. The 'Salesperson' field is highlighted in yellow and labeled 'Field selected'. The status bar at the bottom of the screen shows 'Power View Sheet'.

You have successfully created the internal **Data Model** without leaving the **Power View sheet**.

20. Excel – Power View in Services

When you create Power View sheets in Excel, you can view and interact with them on-premises in Excel Services, and in Office 365. You can only edit Power View sheets in Excel 2013 on a client computer.

- Power View sheets cannot be viewed on **OneDrive**.
- If you save an Excel workbook with Power View sheets to a Power Pivot Gallery, the Power View sheets in the workbook will not be displayed in the Gallery, but they are still in the file. You will see them when you open the workbook.
- When you publish Excel workbooks with Power View sheets to Power BI, Power BI saves the Power View sheets in your workbook as a Power BI report.

Pie Charts

We have already discussed **Pie Chart Visualization** in the previous chapter.

Maps

We have already discussed **Maps** in the previous chapter.

Key Performance Indicators (KPIs)

A **KPI** is a quantifiable measurement for gauging business objectives. For example,

- Sales department of an organization might use a KPI to measure the monthly gross profit against the projected gross profit.
- Accounting department might measure monthly expenditures against revenue to evaluate costs.
- Human resources department might measure quarterly employee turnover.
- Business professionals frequently use KPIs that are grouped together in a business scorecard to obtain a quick and accurate historical summary of business success or to identify trends.

A **KPI** includes **Base Value, Target Value / Goal, and Status**.

- A Base Value is defined by a calculated field that resolves to a value. The calculated field represents the current value for the item in that row of the table or matrix, for example, aggregate of sales, profit for a given period, etc.
- A Target Value (or Goal) is defined by a calculated field that resolves to a value, or by an absolute value. The current value is evaluated against this value. This could be a fixed number, some goal all the rows should achieve, or a calculated field, which might have a different goal for each row. For example, budget (calculated field), average number of sick-leave days (absolute value).

- Status is the visual indicator of the value. In Power View in Excel, you can edit the KPI, choosing which indicators to use and what values to trigger each indicator.

Hierarchies

If your data model has a hierarchy, you can use it in Power View. You can also create a new hierarchy from scratch in Power View.

Step 1: Click on the **Matrix Visualization**.

Power View – Matrix Visualization

ROWS →

NOC_CountryRegion	Sport	Count of Medal
AFS	Taekwondo	5
	Total	1
AHO	Sailing	1
	Total	1
AUG	Athletics	6
	Boxing	6
	Judo	2
	Total	14
ANZ	Aquatics	11
	Athletics	1
	Boxing	15
	Rugby	1
	Tennis	1
	Total	29
ARG	Aquatics	3
	Athletics	5
	Basketball	24
	Boxing	24
	Cycling	4
	Equestrian	1
	Fencing	5
	Football	72
	Hockey	48
	Judo	1

Power View Sheet

Step 2: Add **ROWS / COLUMNS** to the **ROWS / COLUMNS** box. The hierarchy is decided by the order of the fields in the **ROWS** box. You can put fields in any order in a hierarchy in Power View. You can change the order be simply dragging the fields in the **ROWS** Box.

Hierarchy Level 1

Hierarchy Level 2

Hierarchy Level 3

Hierarchy Level 4

Order of ROWS define Hierarchy

NOC_CountryRegion	Sport	Discipline	Year	Count of Medal
AUT	Bobsleigh	Bobsleigh	Total	1
			1964	1
			1968	1
			1982	1
			2002	1
			Total	2
				2
	Canoe / Kayak F	Canoe / Kayak F	1936	1
			1948	1
			1952	2
			1956	1
			1968	1
			Total	3
				3
	Canoe / Kayak S	Canoe / Kayak S	1972	1
			2008	1
			Total	2
				2
	Equestrian	Dressage	1936	1
			1940	1
			Total	2
				2
		Jumping	1992	1

Drill-Up and Drill-Down

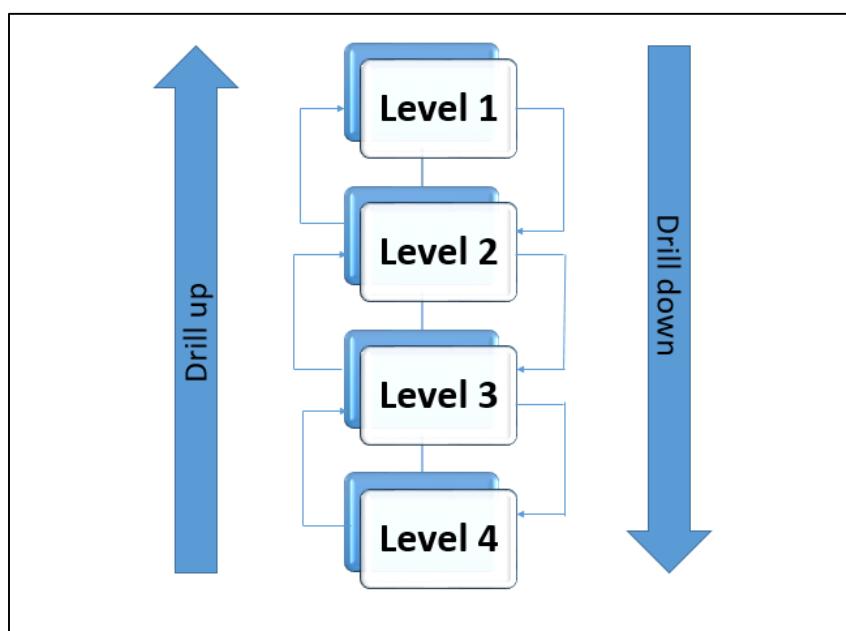
Once you create a hierarchy in Power View, you can drill up and drill down such that you can show just one level at a time. You can drill down for details and drill up for summary.

You can use drill up and drill down in Matrix, Bar, Column, and Pie Chart Visualizations.

Step 1: Order the Fields in the Rows Box to define Hierarchy. Say, we have four Levels in the hierarchy.

The screenshot shows the Microsoft Excel ribbon with the DESIGN tab selected. In the Power View Fields pane, under the ACTIVE section, there are two expanded categories: 'Disciplines' and 'Medals'. Under 'Disciplines', 'Sport' is checked. Under 'Medals', 'Athlete' is checked. Below these, there are sections for 'TILE BY' and 'ROWS'. The 'ROWS' section lists 'NOC_CountryRegion', 'Sport', 'Discipline', and 'Year' as fields to drag between areas. To the left of the table, the text 'Order of ROWS define Hierarchy' is displayed. The table itself is titled 'Medals' and contains data grouped by four levels of hierarchy. The hierarchy levels are labeled on the left: 'Hierarchy Level 1' (NOC_CountryRegion), 'Hierarchy Level 2' (Sport), 'Hierarchy Level 3' (Discipline), and 'Hierarchy Level 4' (Year). The data includes rows for AUT, Biathlon, Bobsleigh, Canoe / Kayak F, Canoe / Kayak S, Equestrian, Dressage, and Jumping, with further breakdowns by year (1954, 1958, 1992, 2002, 1936, 1948, 1952, 1956, 1968, 1972, 2008) and count of medals (1, 1, 1, 2, 2, 1, 1, 1, 1, 1, 1, 2, 3).

The **Hierarchy, Drill down and Drill up** are depicted as follows:



Step 2: Click on the **DESIGN** tab on the ribbon.

Step 3: Click on **Show Levels** in the **Options** group.

The screenshot shows the Microsoft Excel ribbon with the DESIGN tab selected. In the Options group of the ribbon, there is a 'Show Levels' button. A callout arrow points to this button. The main area of the screen displays a Power View visualization titled 'Medals'. The visualization shows medal counts by NOC, Sport, Discipline, and Year. The 'Power View Fields' pane on the right lists fields from 'Disciplines' and 'Medals' categories, with 'Count of Medal' selected as the value. The 'ROWS' section of the Power View Fields pane includes 'NOC_CountryRegion', 'Sport', 'Discipline', and 'Year'.

Step 4: Click on **Rows – Enable Drill Down** one Level at a time.

The screenshot shows the Microsoft Excel ribbon with the DESIGN tab selected. A context menu is open over the Power View visualization, with the 'Rows – Enable Drill Down One Level at a Time' option highlighted. The main area of the screen displays the same 'Medals' visualization as in the previous step. The 'Power View Fields' pane on the right remains the same. The 'ROWS' section of the Power View Fields pane includes 'NOC_CountryRegion', 'Sport', 'Discipline', and 'Year'.

The **Matrix** collapses to display only **Level 1 Data**. You find an arrow on right side of the Level 1 Data item indicating **Drill down**.

Power View – Matrix Visualization
Showing only Level 1 Data

NOC_CountryRegion	Sport	Count of Medal
AFG	Athletics	1
AHO	Card	3
ALG	Discipline	3
ANZ	Event	3
ARM	Medals	3
AUS	Medalist	3
AUT	MedalEvent	3
AZE	MedalID	3
BAH	MedalistID	3
BAR	MedalEventID	3
BDI	MedalID	3
BEL	MedalistID	3
BER	MedalEventID	3
BLR	MedalistEventID	3
BOH	MedalistEventID	2
BRA	MedalistEventID	3
BUL	MedalistEventID	3
BWE	MedalistEventID	1
CAN	MedalistEventID	3
CHN	MedalistEventID	3
CIV	MedalistEventID	1
CMR	MedalistEventID	3
COL	MedalistEventID	3
LPR	MedalistEventID	3

Step 5: Click on the **Drill down** arrow. Alternatively, you can double-click on the Data item to Drill down. That particular Data item Drills down by one Level.

You have one arrow on the left indicating Drill up and one arrow on the right indicating Drill down.

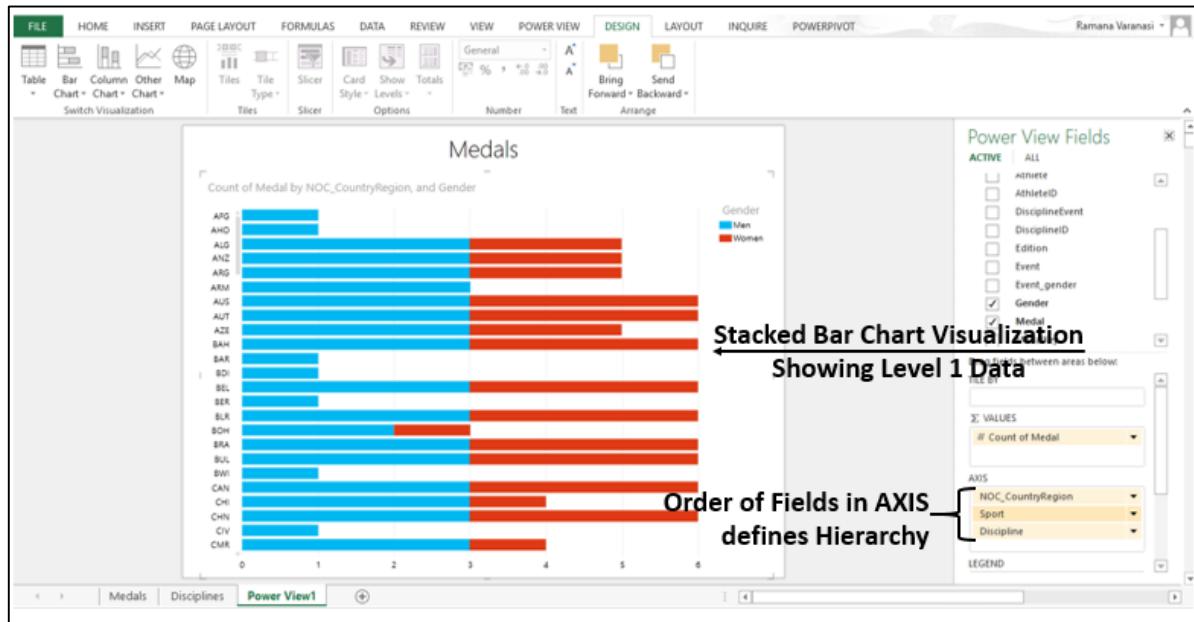
Power View – Matrix Visualization
Data Drilled to Next Level

NOC_CountryRegion	Sport	Count of Medal
AFG	Athletics	1
AHO	Card	3
ALG	Discipline	3
ANZ	Event	3
ARM	Medals	3
AUS	Medalist	3
AUT	MedalEvent	3
AZE	MedalID	3
BAH	MedalistID	3
BAR	MedalEventID	3
BDI	MedalistID	3
BEL	MedalistEventID	3
BER	MedalistEventID	3
BLR	MedalistEventID	3
BOH	MedalistEventID	2
BRA	MedalistEventID	3
BUL	MedalistEventID	3
BWE	MedalistEventID	1
CAN	MedalistEventID	3
CHN	MedalistEventID	3
CIV	MedalistEventID	1
CMR	MedalistEventID	3
COL	MedalistEventID	3
LPR	MedalistEventID	3

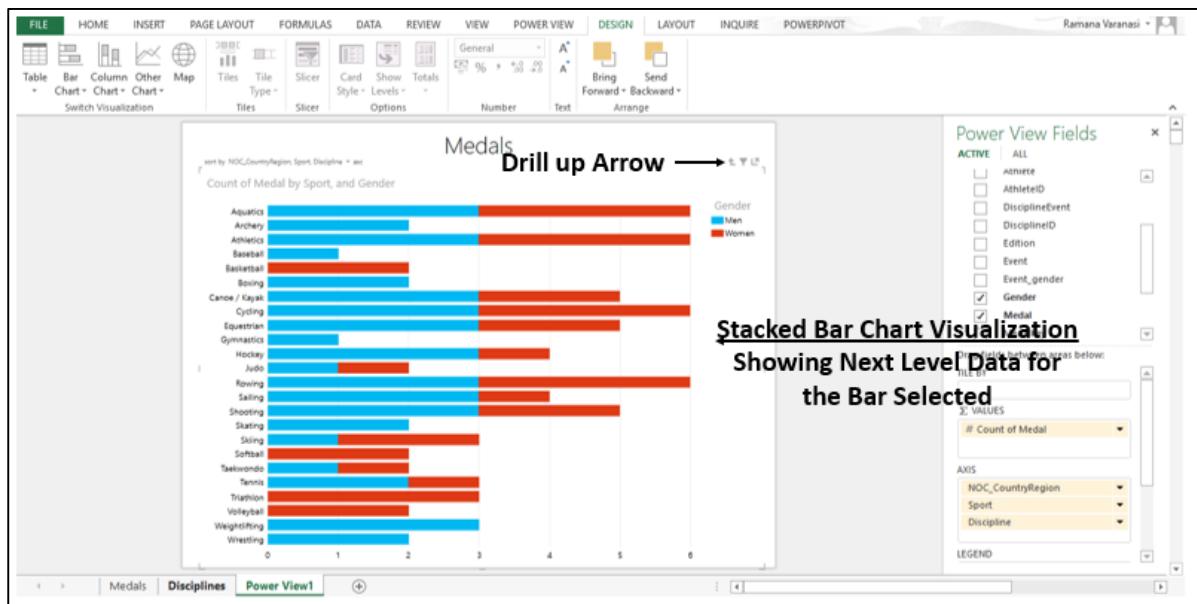
You can double-click one value in a level to expand to show the Values under that one in the Hierarchy. You click the **up** arrow to drill back up. You can use Drill up and Drill down in Bar, Column, and Pie Charts also.

Step 6: Switch to **Stacked Bar Chart Visualization**.

Step 7: Order the Fields in the AXIS Box to define the Hierarchy. **Stacked Bar Chart** with only Level 1 Data is displayed.



Step 8: Double-click on a Bar. The Data in the next Level of that particular bar is displayed.



You can Drill down one Level at a time by double-clicking on any bar. You can Drill up one Level by clicking the Drill up arrow on the Right Top Corner.

21. Excel – Format Reports

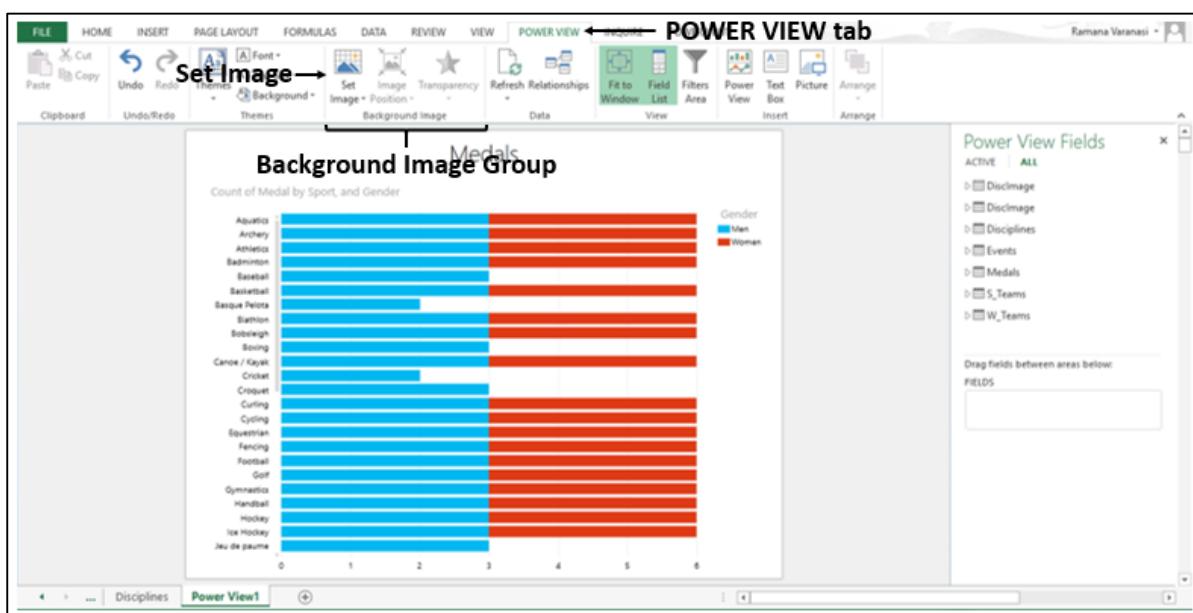
In Excel 2013, Power View has 39 additional themes with more varied chart palettes as well as fonts and background colors. When you change the theme, the new theme applies to all the Power View Views in the Report or Sheets in the Workbook.

You can also change the text size for all of your Report Elements.

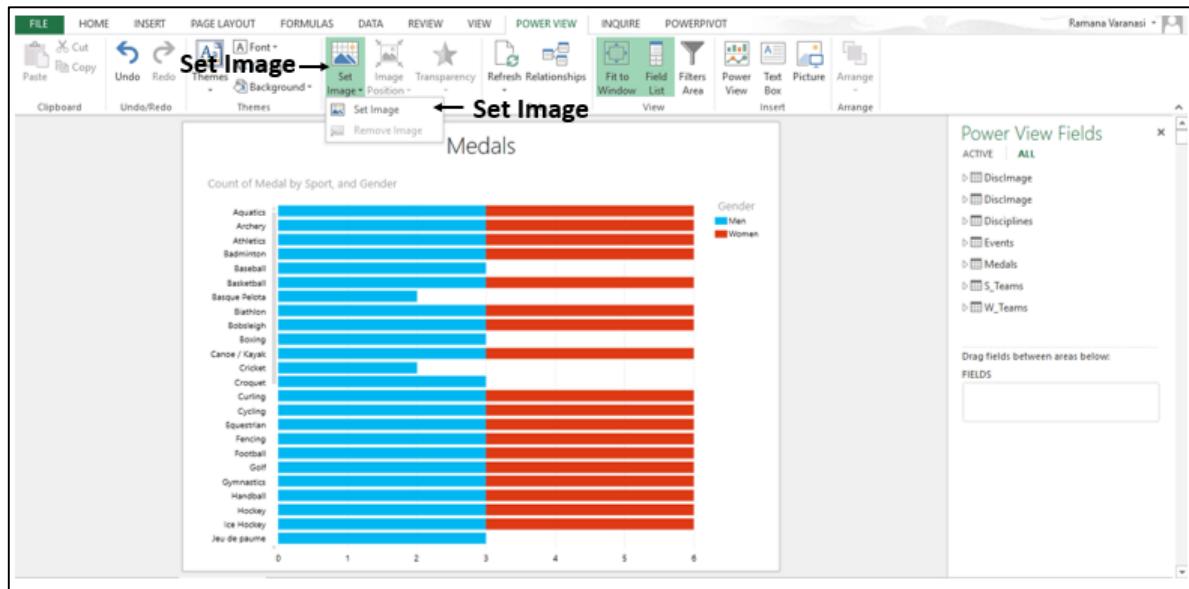
You can add Background Images, choose Background Formatting, choose a Theme, change the Font Size for One Visualization, change the Font or Font Size for the whole sheet and Format numbers in a Table, Card, or Matrix.

Step 1: Click on the **Power View** tab on the ribbon.

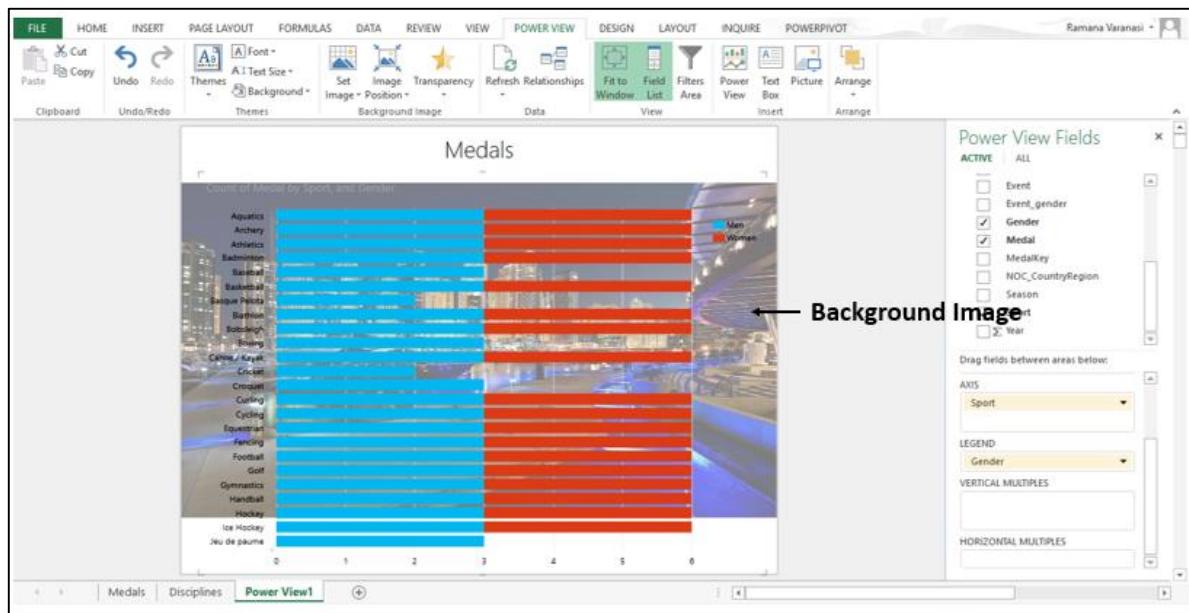
Step 2: Click on **Set Image** in the **Background Image** group.



Step 3: Click on **Set Image** in the drop-down menu. The File Browser opens.



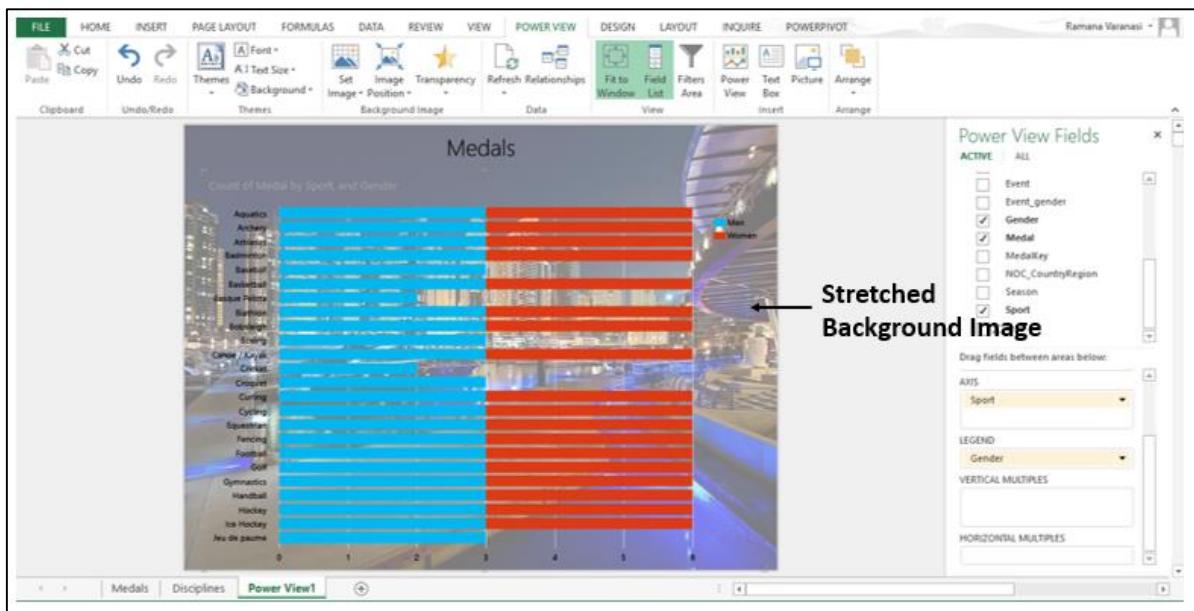
Step 4: Browse to the Image File you want to use as Background and click open. The image appears as background in the Power View.



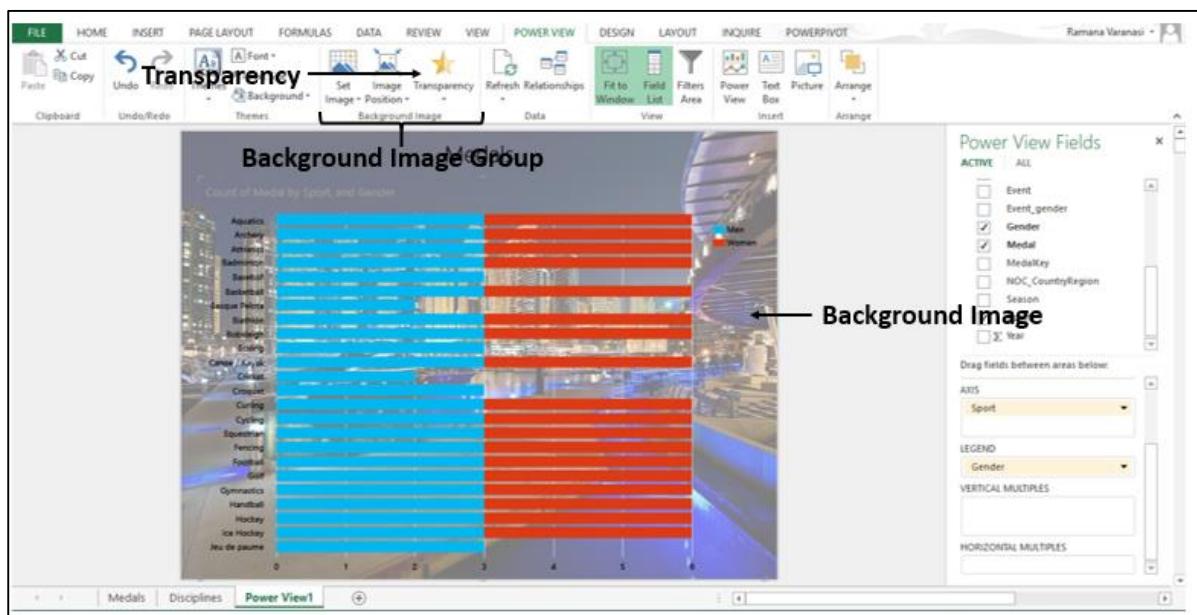
Step 5: Click on **Image Position** in the **Background Image** group.

Step 6: Click on **Stretch** in the Drop down menu as shown in the image given below.

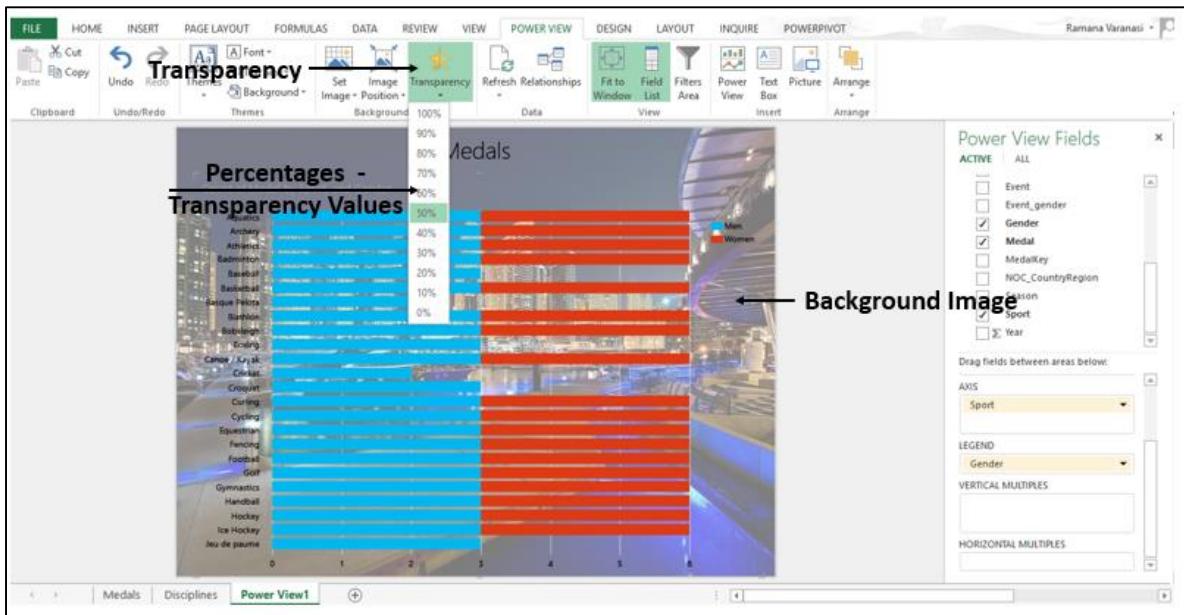
The **Image** stretches to the full size of **Power View**.



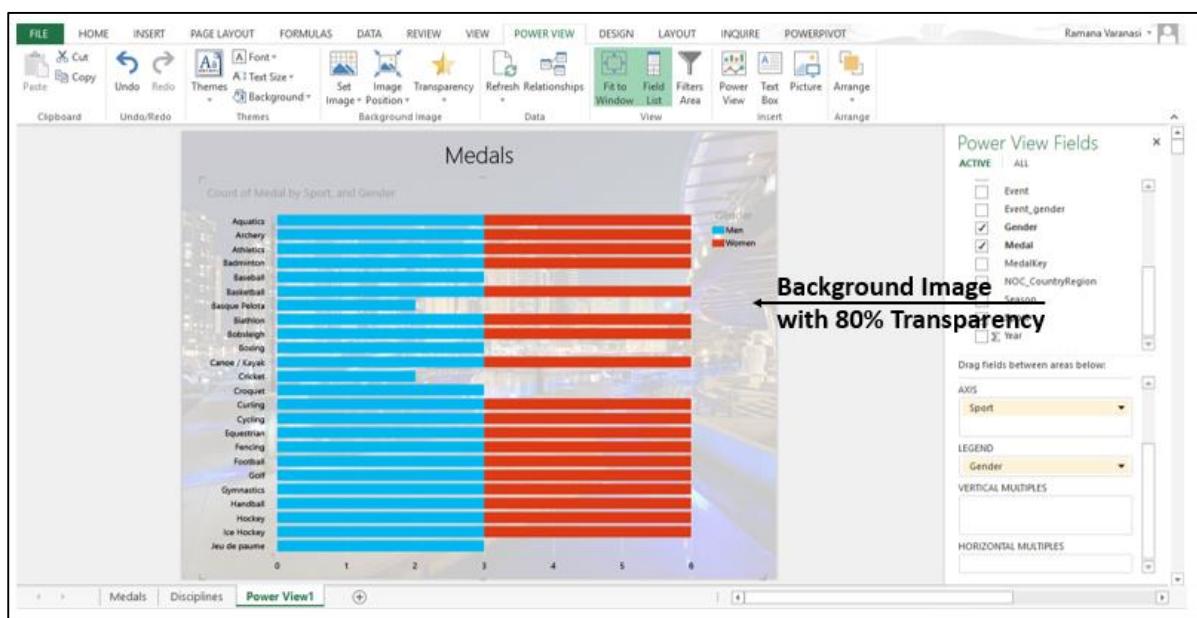
Step 7: Click on **Transparency** in the **Background Image** group.



Step 8: Click on **80%** in the Drop down box.



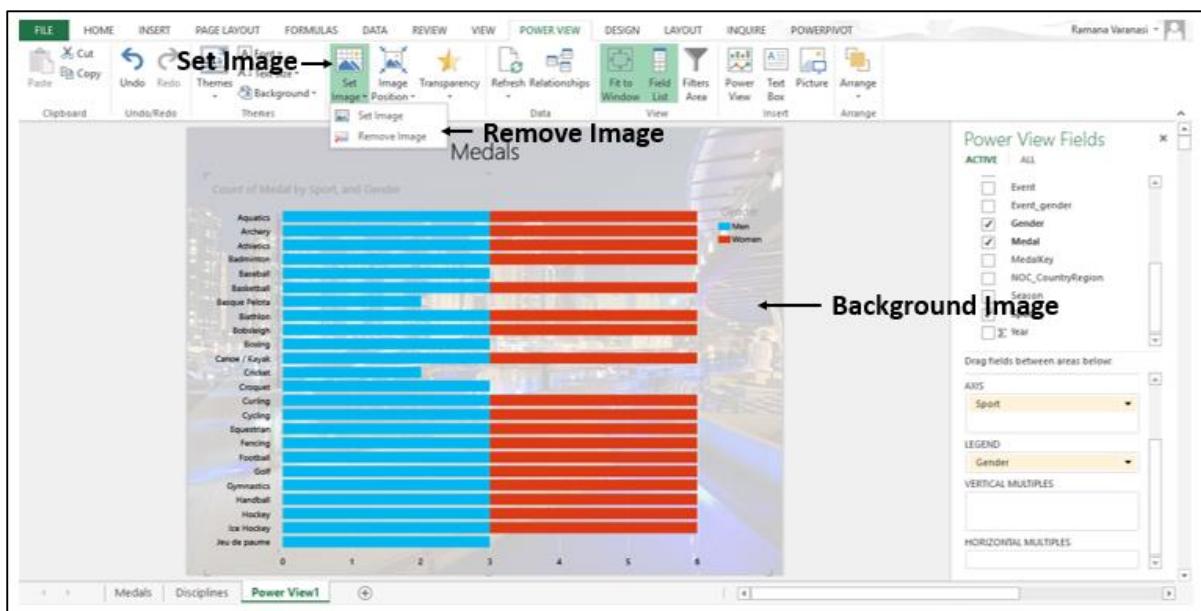
The higher the percentage, the more transparent (less visible) the image.



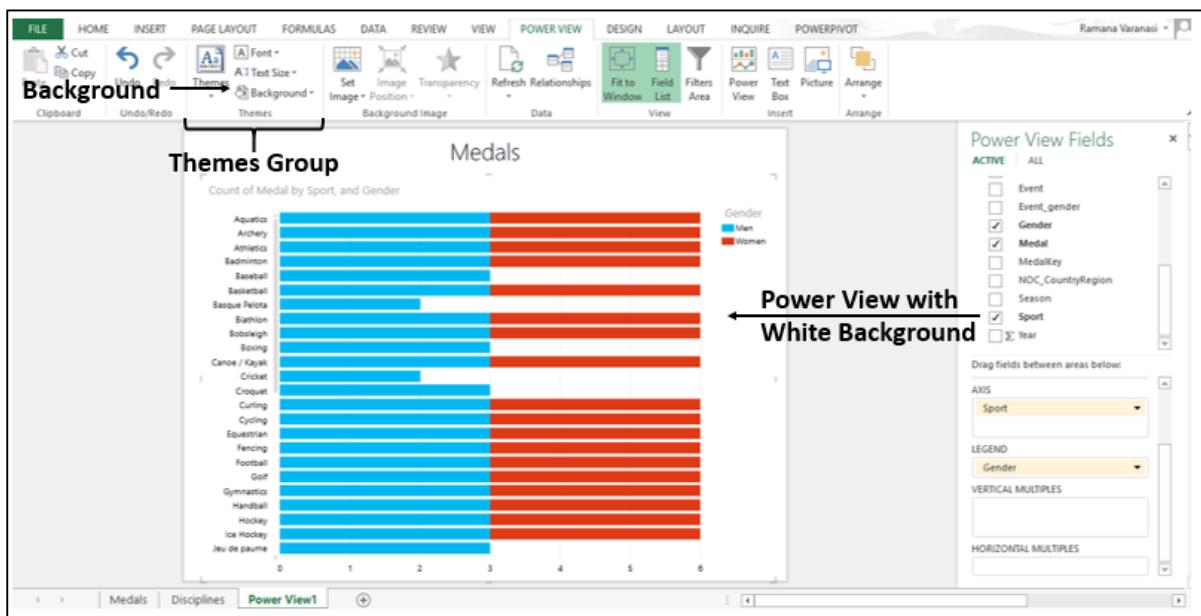
Instead of images, you can also set different backgrounds to Power View.

Step 9: Click on **Power View** tab on the ribbon.

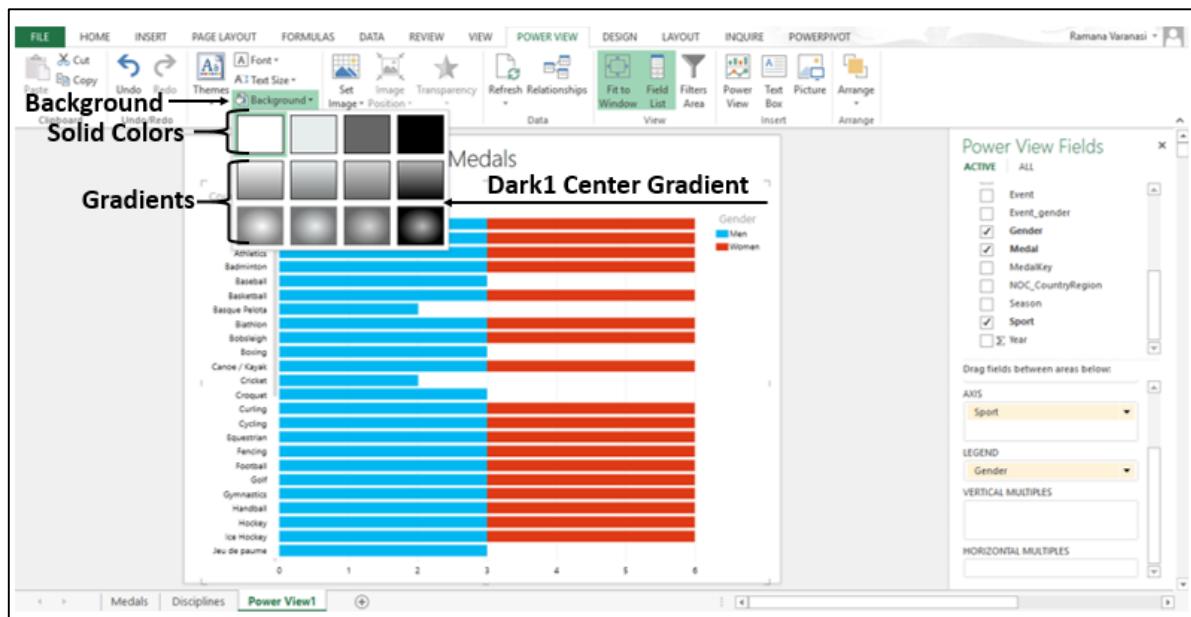
Step 10: Click on **Set Image** in the **Background Image** group.

Step 11: Click on Remove Image.

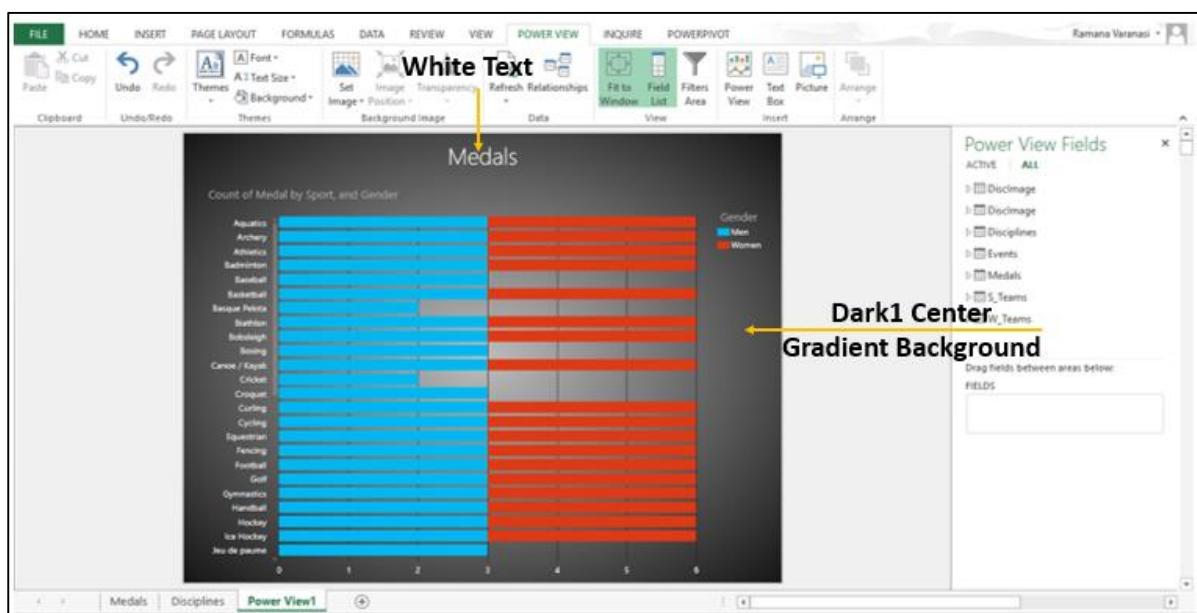
Now, Power View is with White Background.

Step 12: Click on **Background** the in **Themes** Group.

You have different backgrounds, from solids to a variety of gradients.



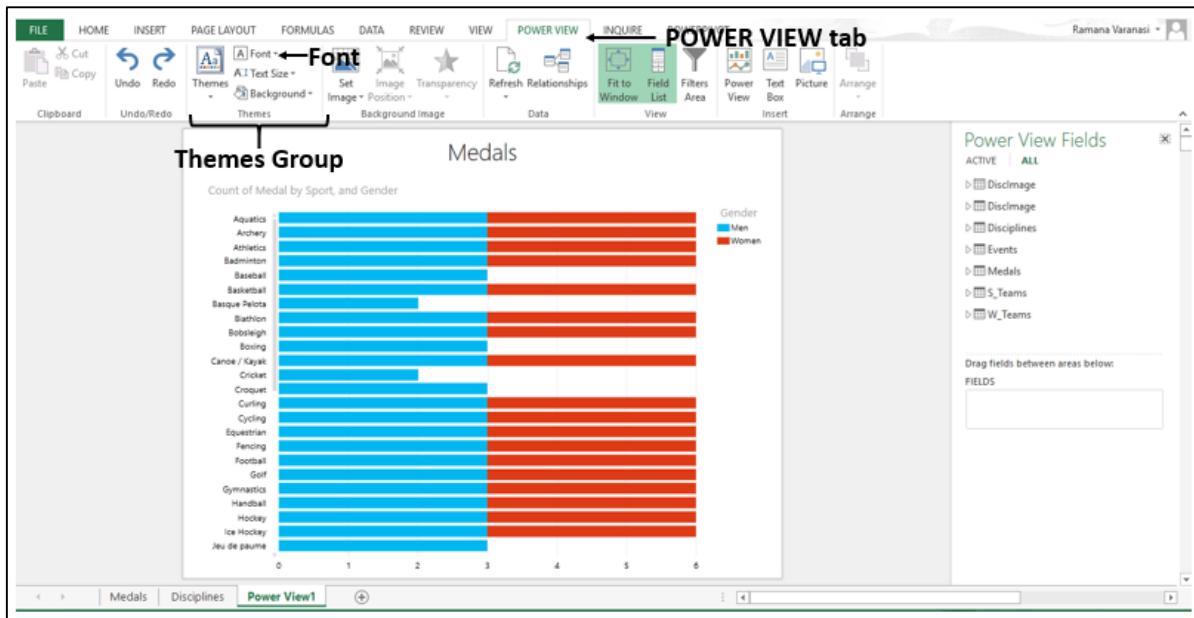
Step 13: Click on Dark1 Center Gradient.



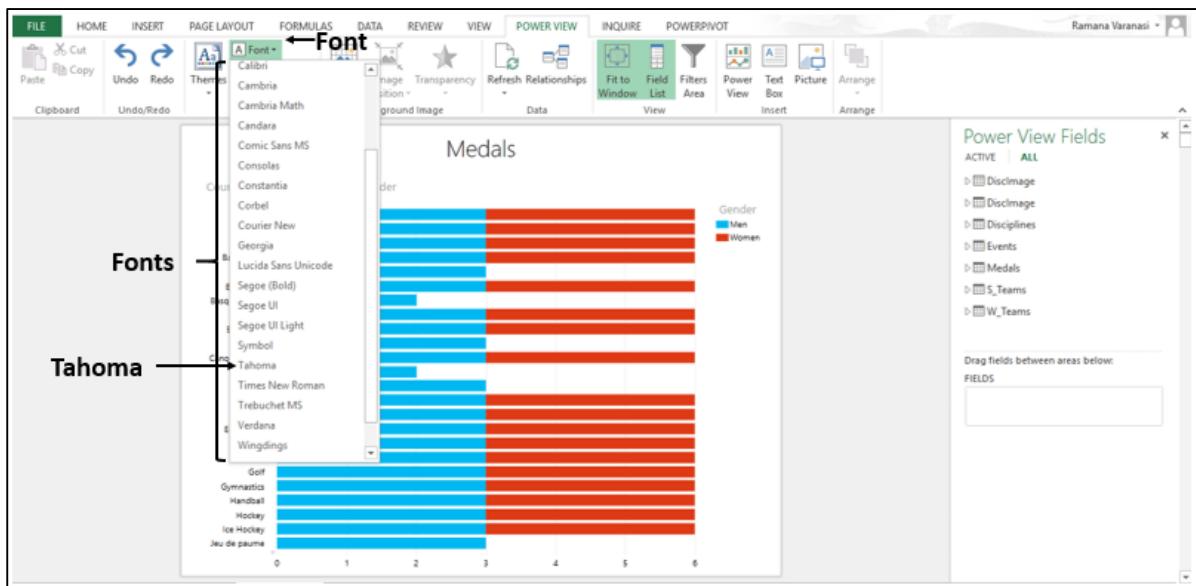
The background changes to **Dark1 Center Gradient**. As the background is darker, the text turns into white color.

Step 14: Click on the Power View tab on the ribbon.

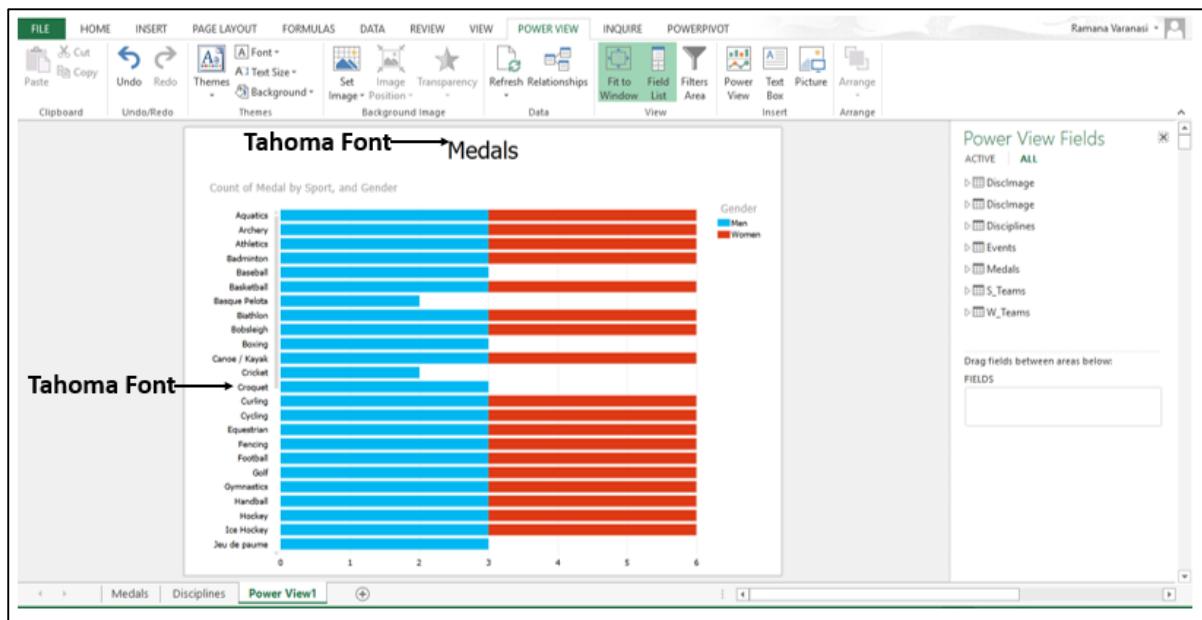
Step 15: Click on **Font** in the **Themes** group.



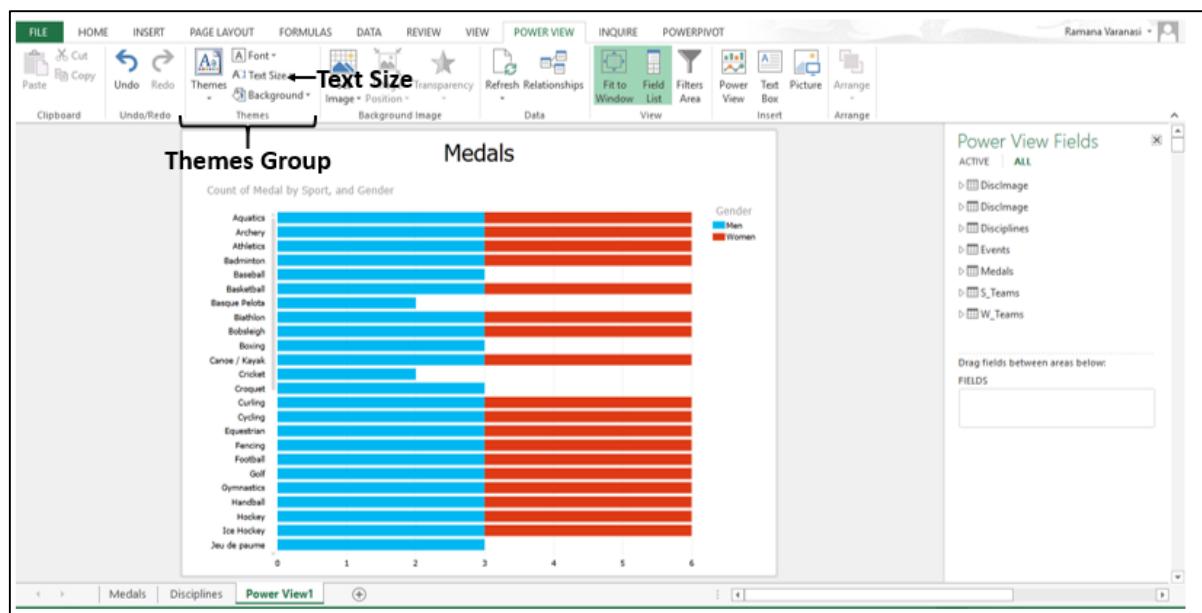
All the available fonts will be displayed in the Drop down list.



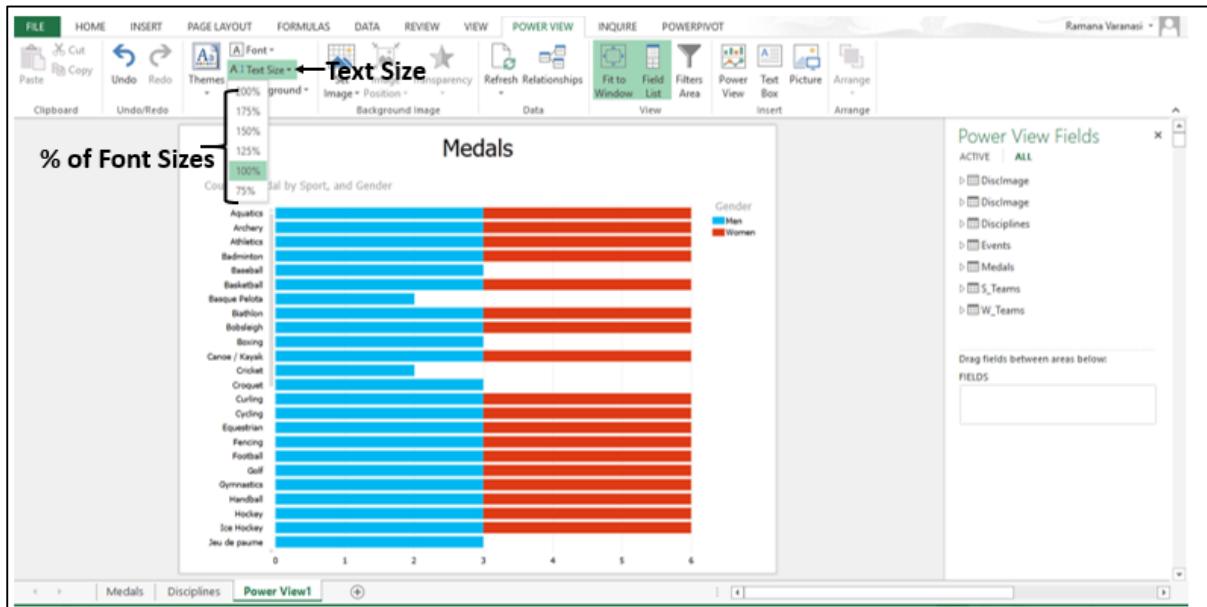
Step 16: Click on **Tahoma**. The font of the text changes to Tahoma.



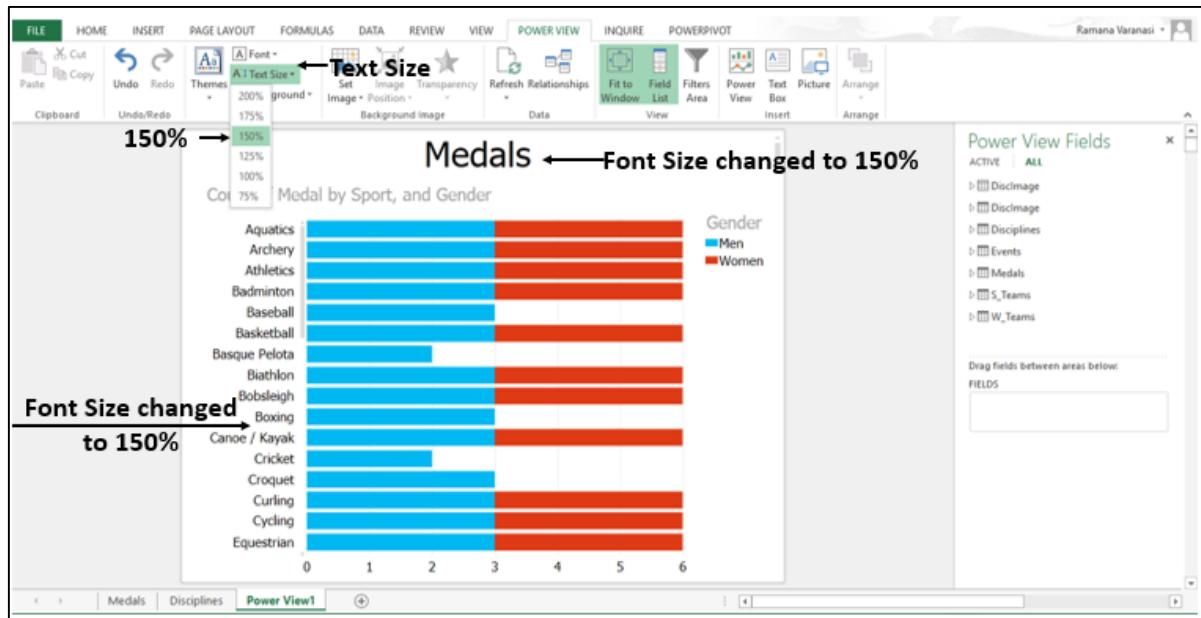
Step 17: Click on **Text Size** in the **Themes** group.



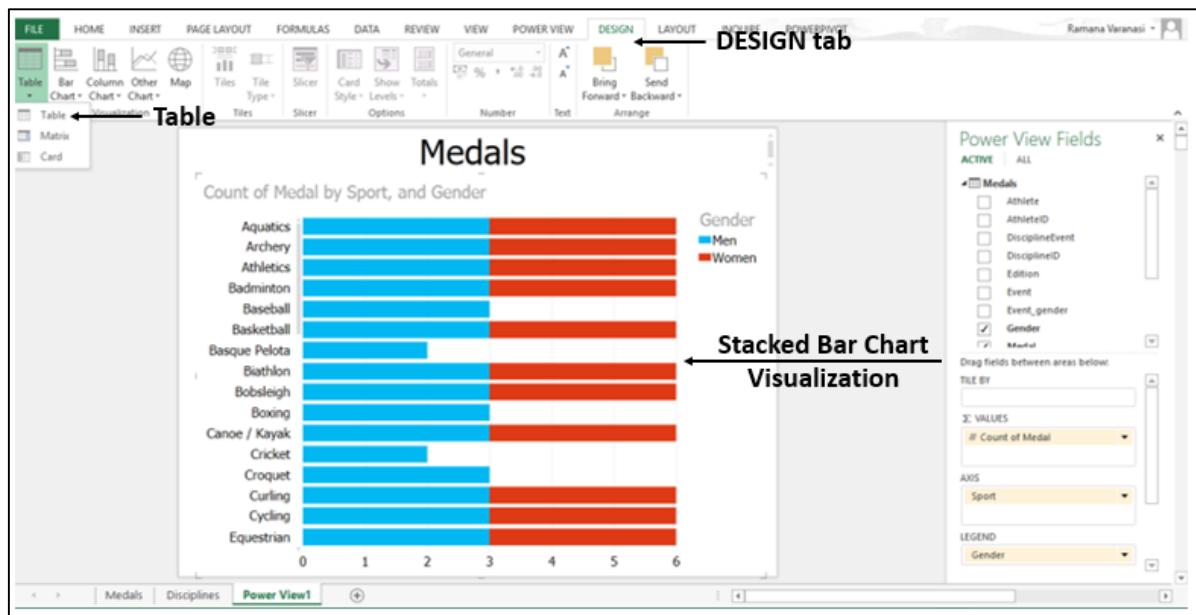
The percentages of the font sizes will be displayed. The default font size 100% is highlighted.



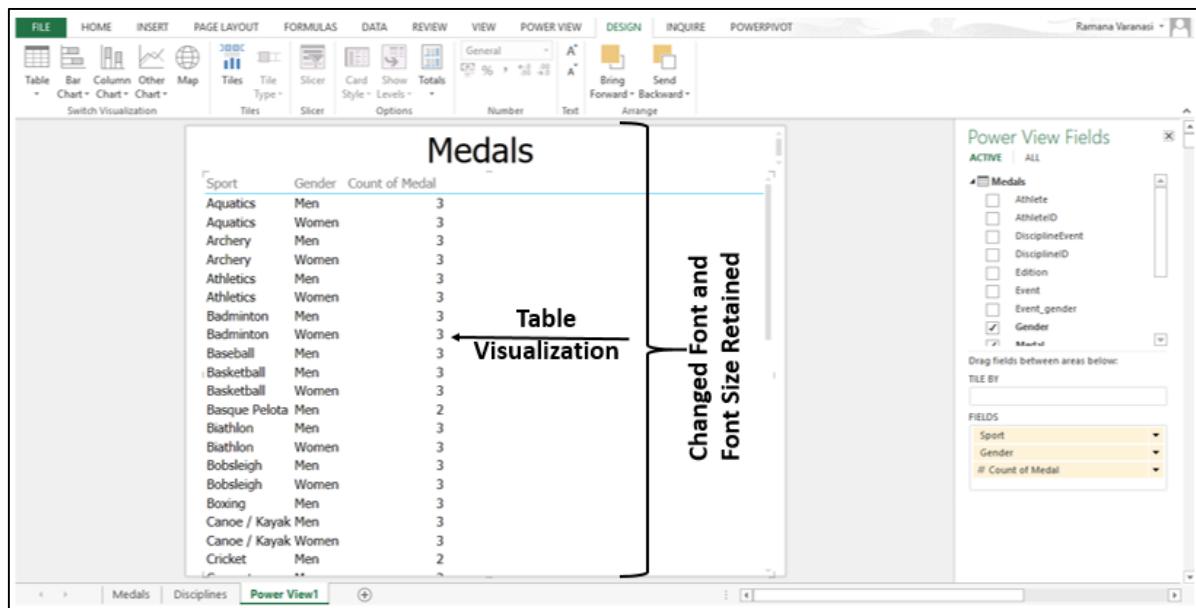
Step 18: Select 150%. The font size changes from 100% to 150%.



Step 19: Switch **Stacked Bar Chart Visualization** to **Table Visualization**.



The changed font and font size are retained in the **Table Visualization**.



When you change the font in one Visualization, the same font is applied to all visualizations except for the font in a **Map Visualization**. You cannot have different fonts for different Visualizations. However, you can change the font size for individual visualizations.

Step 20: Click on a **Cell** in the **Column** containing **Numbers**.

Step 21: Click on Number in the Number Group.

Number

Medals Number Group

Selected Cell in the Column containing Numbers

Sport	Gender	Count of Medal
Aquatics	Men	3
Aquatics	Women	3
Archery	Men	3
Archery	Women	3
Athletics	Men	3
Athletics	Women	3
Badminton	Men	3
Badminton	Women	3
Baseball	Men	3
Basketball	Men	3
Basketball	Women	3
Basque Pelota	Men	2
Biathlon	Men	3
Biathlon	Women	3
Bobsleigh	Men	3
Bobsleigh	Women	3
Boxing	Men	3
Canoe / Kayak	Men	3
Canoe / Kayak	Women	3
Cricket	Men	2

Power View Fields

ACTIVE | ALL

Medals

TILE BY

FIELDS

Sport
Gender
Count of Medal

Step 22: Click on Percentage in the Drop down menu.

Number

Percentage

Medals Percentage

Sport	Gender	Count of Medal
Aquatics	Men	3
Aquatics	Women	3
Archery	Men	3
Archery	Women	3
Athletics	Men	3
Athletics	Women	3
Badminton	Men	3
Badminton	Women	3
Baseball	Men	3
Basketball	Men	3
Basketball	Women	3
Basque Pelota	Men	2
Biathlon	Men	3
Biathlon	Women	3
Bobsleigh	Men	3
Bobsleigh	Women	3
Boxing	Men	3
Canoe / Kayak	Men	3
Canoe / Kayak	Women	3
Cricket	Men	2

Power View Fields

ACTIVE | ALL

Medals

TILE BY

FIELDS

Sport
Gender
Count of Medal

The entire column containing the selected cell gets converted to the selected format.

The screenshot shows a Microsoft Excel window with the ribbon menu at the top. The main area displays a 'Power View' visualization titled 'Medals' with a table of data. The table has columns for 'Sport', 'Gender', and 'Count of Medal'. A specific cell in the 'Count of Medal' column for Badminton (Men) is highlighted with a blue selection bar, indicating it is the active cell. A callout bubble points to this cell with the text 'Selected Cell in the Column'. Another callout bubble points to the entire column header with the text 'Entire Column is Formatted'. To the right of the table, there is a 'Power View Fields' pane showing various fields like Athlete, AthleteID, DisciplineEvent, DisciplineID, Edition, Event, Event_gender, and Medal. Below the fields, there are sections for 'TILE BY' and 'FIELDS'.

You can format numbers in **Card and Matrix Visualizations** also.

Hyperlinks

You can add a **Hyperlink** to a text box in Power View. If Data Model has a field that contains a Hyperlink, add that field to the Power View. It can link to any URL or email address.

This is how you could get the sport images in Tiles in **Tiles Visualization** in the previous section.

Printing

You can print **Power View sheets** in Excel 2013. What you print is what you see on the **sheet** when you send it to the printer. If the sheet or view contains a region with a scroll bar, the printed page contains the part of the region that is visible on the screen. If a sheet or view contains a region with tiles, then whichever tile is selected is the one that prints.

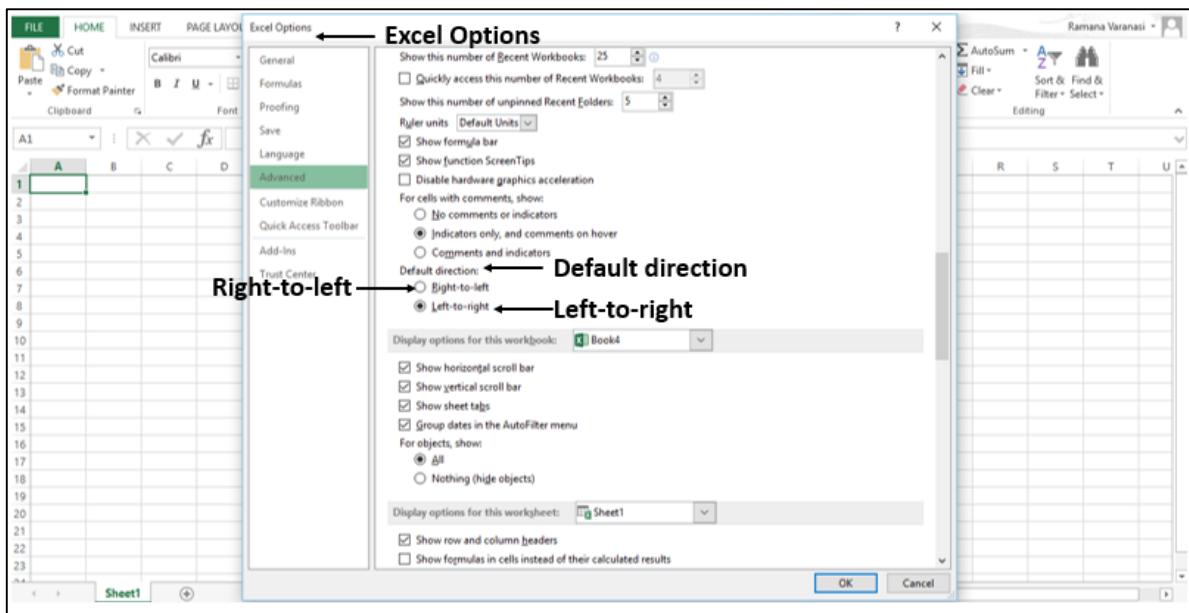
Support for right-to-left languages

Power View in Excel 2013 supports right-to-left languages. Power View takes the setting for default direction from Excel. You can change those settings.

Step 1: Click on **File**.

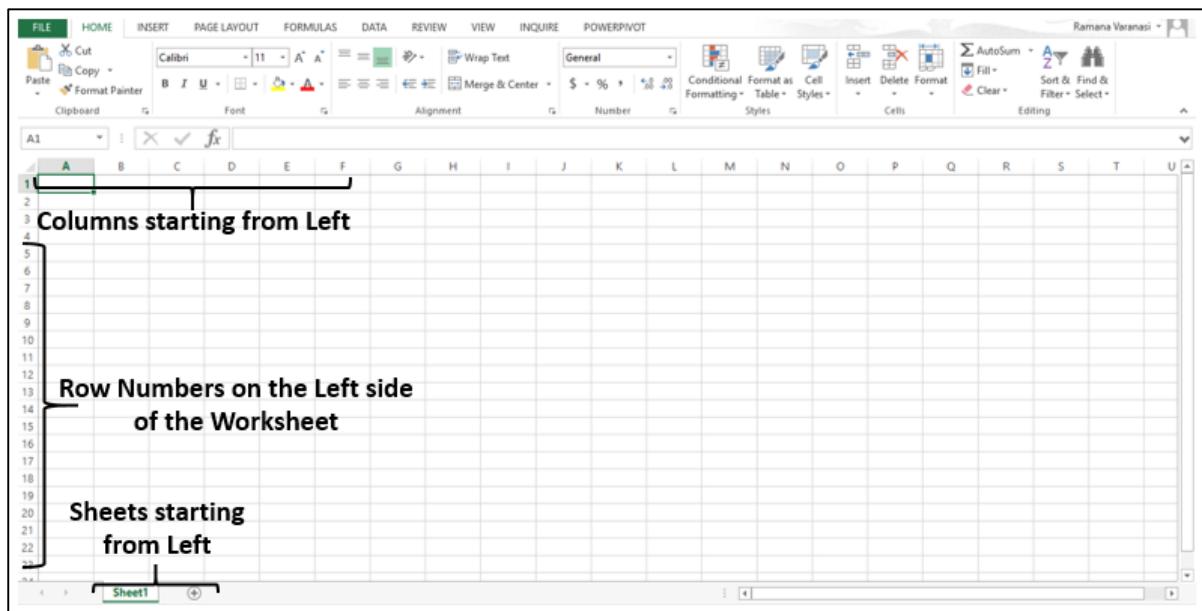
Step 2: Click on **Options**. The Excel **Options** window appears.

Step 3: By default, the direction has two options Right-to-left and Left-to-right.

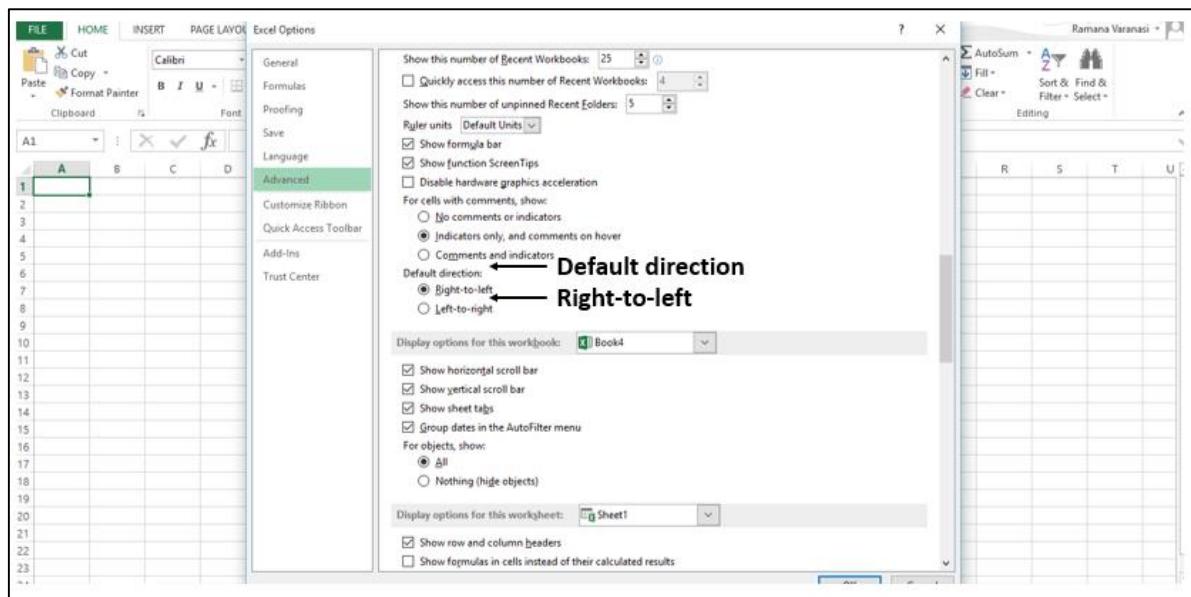


Step 4: Set the default direction to **Left-to-right**.

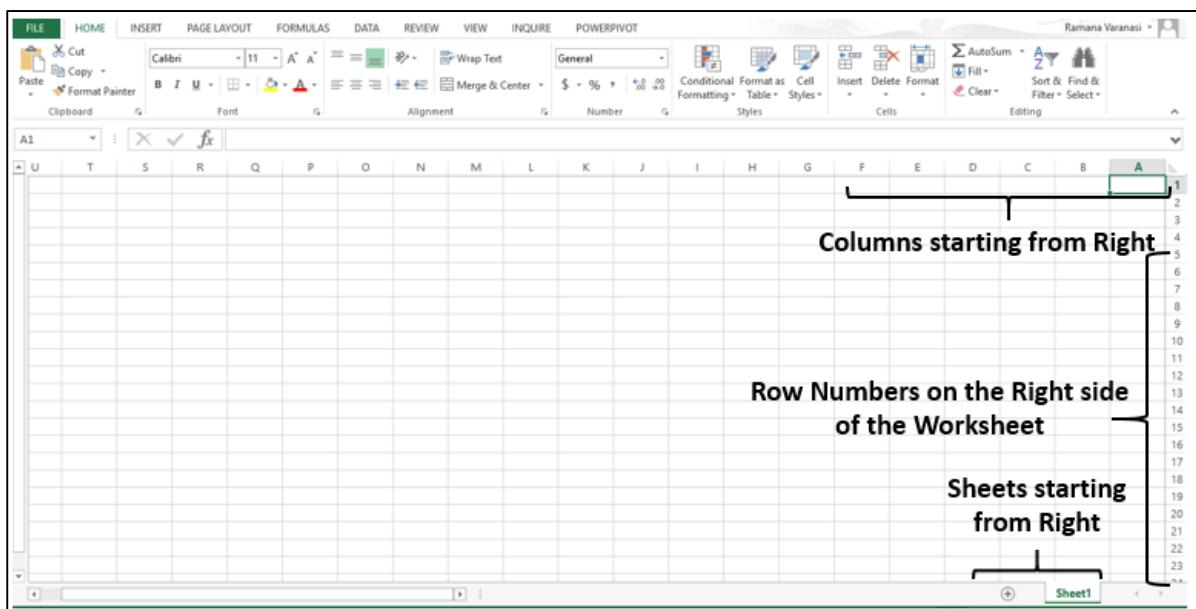
Step 5: Click **OK**.



Step 6: Change the default direction to **Right-to-left**.



Step 7: Click **OK**. You can see that the columns are now starting from the right side of the screen as shown in the image given below.



Microsoft Office supports **right-to-left** functionality and features for languages that work in a right-to-left or a combined right-to-left, left-to-right environment for entering, editing, and displaying text. In this context, "**right-to-left languages**" refers to any writing system that is written from right to left and includes languages that require contextual shaping, such as Arabic, and languages that do not. You can change your display to read right-to-left or change individual files so their contents read from right to left.

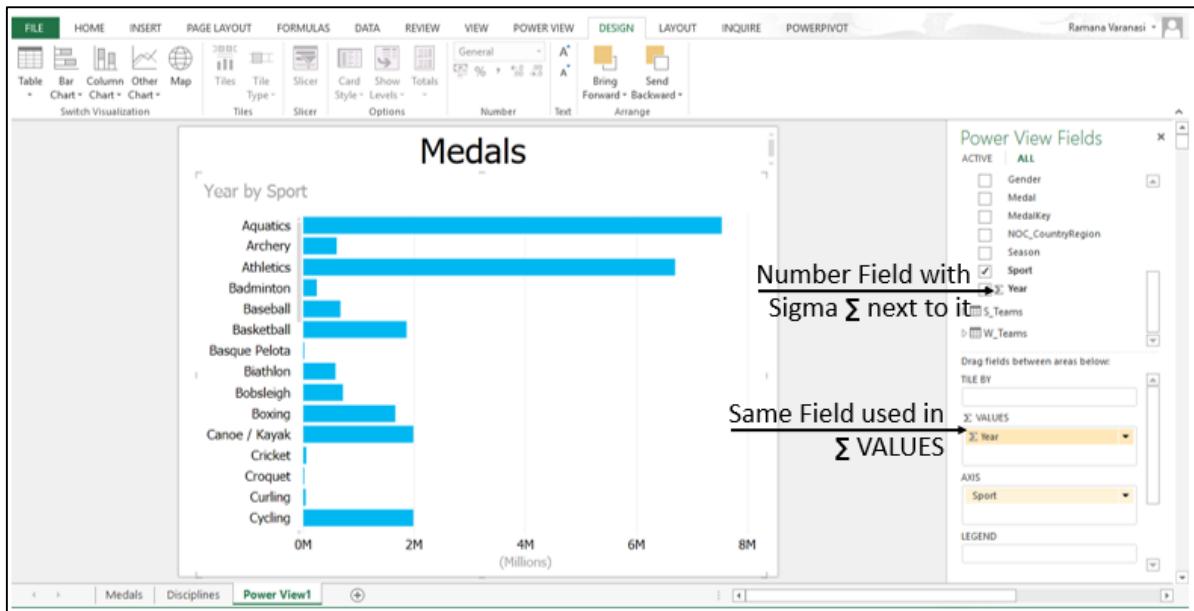
If your computer does not have a **right-to-left** language version of Office installed, you will need to install the appropriate language pack. You must also be running a Microsoft Windows operating system that has right-to-left support — for example, the Arabic version of Windows Vista Service Pack 2 — and enable the keyboard language for the right-to-left language that you want to use.

22. Excel – Handling Integers

In **Power View**, to convert a table to a chart, at least one data column needs to be aggregated. In Excel 2013, Power View aggregates both decimal numbers and integers by default. A Data Model designer can still specify other default behavior, but that is the default.

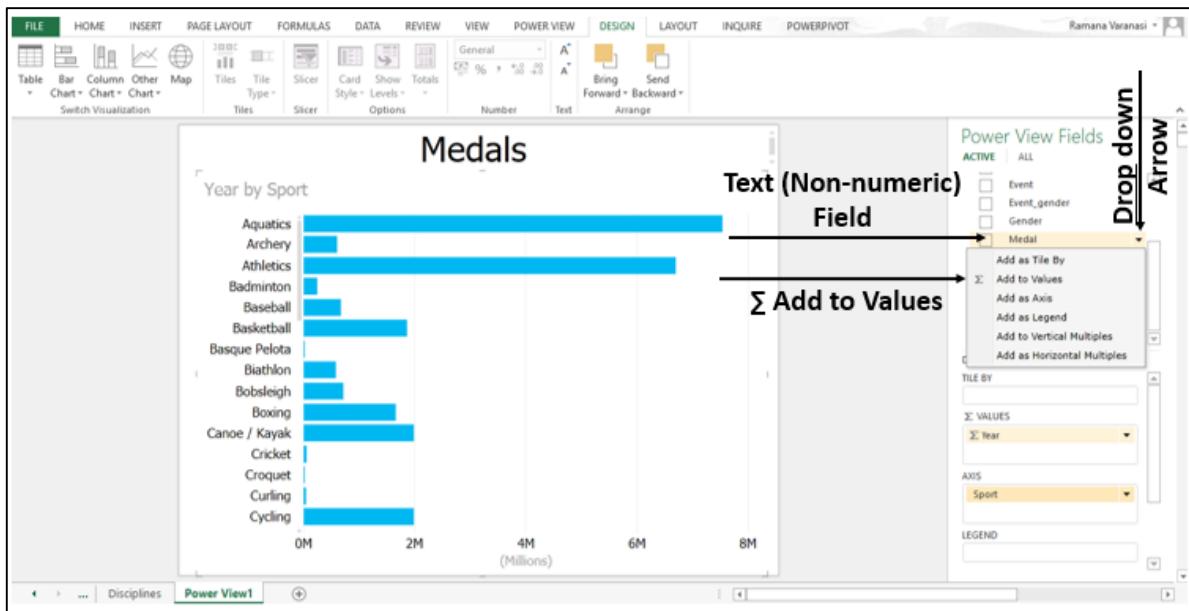
In **Power View**, in the **Power View Fields**, some number fields will have a **Sigma Σ** symbol next to them. They are **aggregates**, meaning they will be **summed** or **averaged**.

Step 1: Click on **Stacked Bar Chart**.



Power View has taken the **Year** as aggregate, as that is the only **numeric field** in the selected fields.

Step 2: Click on the **drop-down** arrow next to a **text (non-numeric) field** in the **Power View Fields**.



Step 3: Drag that field to Σ VALUES box.



Power View has taken it as **Count** of the Values of the Field.

Power Query

Power Query is a data discovery and query tool in Excel 2013. You can use Power Query to

- Import data from external data sources, including big data sources like Hadoop and Facebook, shaping the data before you bring it into Excel and bringing in only the data you need.
- Search for public data from sources such as Wikipedia.

- Merge data from a variety of data sources, or append tables together, such as data from several shared tables in SQL Azure.
- Bring the result into Excel as a single table for:
 - Visualizing in Power Map and Power View.
 - Further analysis and modeling in Power Pivot.
- Share queries to the Power BI data catalogue so others can use it as a starting point for their data exploration.
- “**Unpivot**” source data from a PivotTable or matrix format to a flat table.

To summarize, the Power Query Data Sources are:

Web page, Excel or CSV file, XML file, Text file, Folder, SQL Server database, Microsoft Azure, SQL Database, Access database, Oracle database, IBM DB2 database, MySQL database, PostgreSQL Database, Sybase Database, Teradata Database, SharePoint List, OData feed, Microsoft Azure Marketplace, Hadoop File (HDFS), Microsoft Azure HDInsight, Microsoft Azure Table Storage, Active Directory, Microsoft Exchange and Facebook.

Power BI Desktop

Power BI is a collection of online services and features that enables you to find and visualize data, share discoveries, and collaborate in intuitive new ways. Power BI extends to all your mobile devices, too.

Power BI introduces the **Power BI Desktop**, a dedicated report-authoring tool that enables you to transform data, create powerful reports and visualizations, and easily publish to the Power BI service.

Power BI Desktop lets you create a collection of queries, data connections, and reports that can easily be shared with others. Power BI Desktop integrates proven Microsoft technologies – the powerful Query engine, data modeling, and visualizations – and works seamlessly with the online Power BI service.

With the combination of Power BI Desktop (where analysts and others can create powerful data connections, models and reports) and the Power BI service (where Power BI Desktop reports can be shared so the users can view and interact with them), new insights from the world of data are easier to model, build, share, and extend.

Data analysts will find Power BI Desktop a powerful, flexible, and a highly accessible tool to connect with and shape the world of data, build robust models, and create well-structured reports.

You can **perform** the following **tasks** in **Power BI**:

- Connect to Data
- Shape Data
- Combine Data
- Build Reports
- Share Your Work

Connect to Data

You can contact various web resources and find the ever-growing data in the world. You can **Connect** to the **Data Source** so that you can retrieve the Data you want and **Adjust** the **data** to meet your needs. The process of adjusting the connected data is called **shaping the data**.

Shape Data

As you **Shape the Data**, a Query Editor follows your instructions to adjust the data while loading. The original data source is not affected; only this particular view of the data is shaped.

Steps to Shape Data may include:

- Rename a Table
- Rename a Column
- Transform a Data Type
- Delete Column
- Change text to numbers
- Remove Rows
- Setting the First Row as Headers

Combine Data

If the tables are a result of the queries you applied to the data, they are often referred to as queries. You can **combine** two tables, or queries, into one.

There are two primary ways of combining queries – **merging** and **appending**.

When you have one or more columns to add to another query, you merge the queries. When you have additional rows of data to add to an existing query, you append the query.

If you have enough Data to create interesting Reports, save the Data as Power BI Desktop (.pbix) file. You can Load this data file whenever you want and you can make changes and Reload.

Build Reports

You can build Reports in Power BI Desktop Report view.

The Report view has five main areas:

- The **ribbon**, which displays common tasks associated with reports and visualizations.
- The **Report** view, or canvas, where visualizations are created and arranged.
- The **Pages** tab area along the bottom, which lets you select or add a report page.

- The **Visualizations** pane, where you can change visualizations, customize colors or axes, apply filters, drag fields, and more.
- The **Fields** pane, where query elements and filters can be dragged onto the **Report** view, or dragged to the **Filters** area of the **Visualizations** pane.

You can create different types of interesting **reports** and **visualizations**.

Share Your Work

You can share a completed Power BI Desktop report with the others on the Power BI service. There are a few ways to share your work in Power BI Desktop. You can

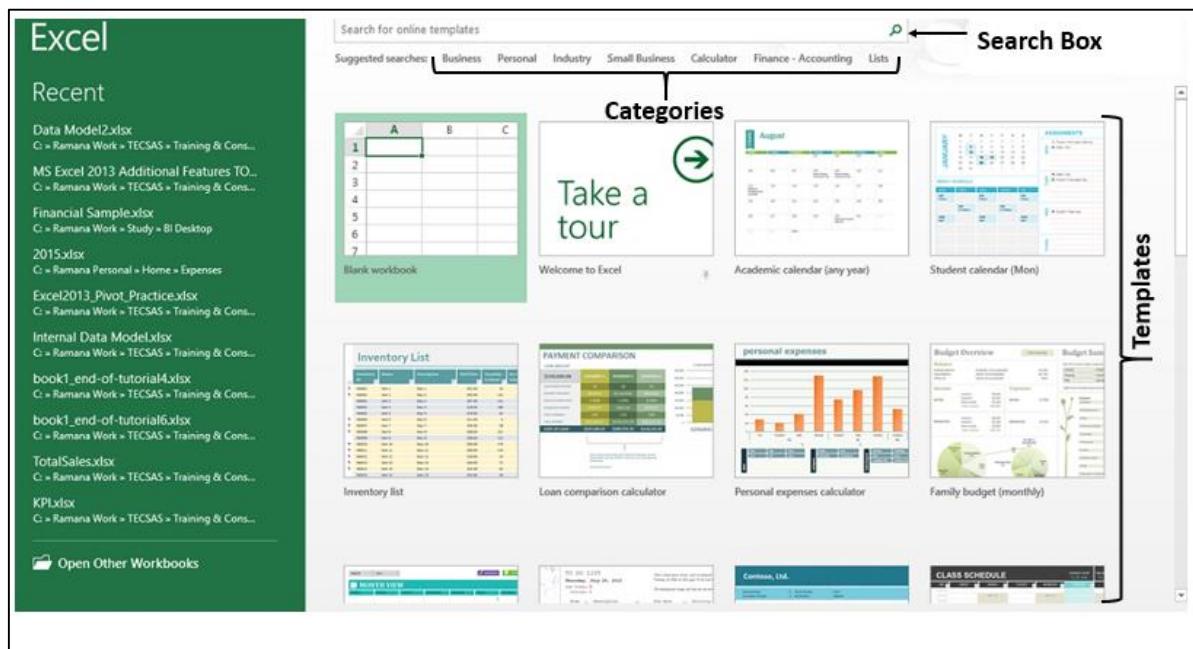
- publish to the Power BI service
- upload the **.pbix** file directly from the Power BI service
- save the **.pbix** file and send it like any other file

Part 6: Other Features

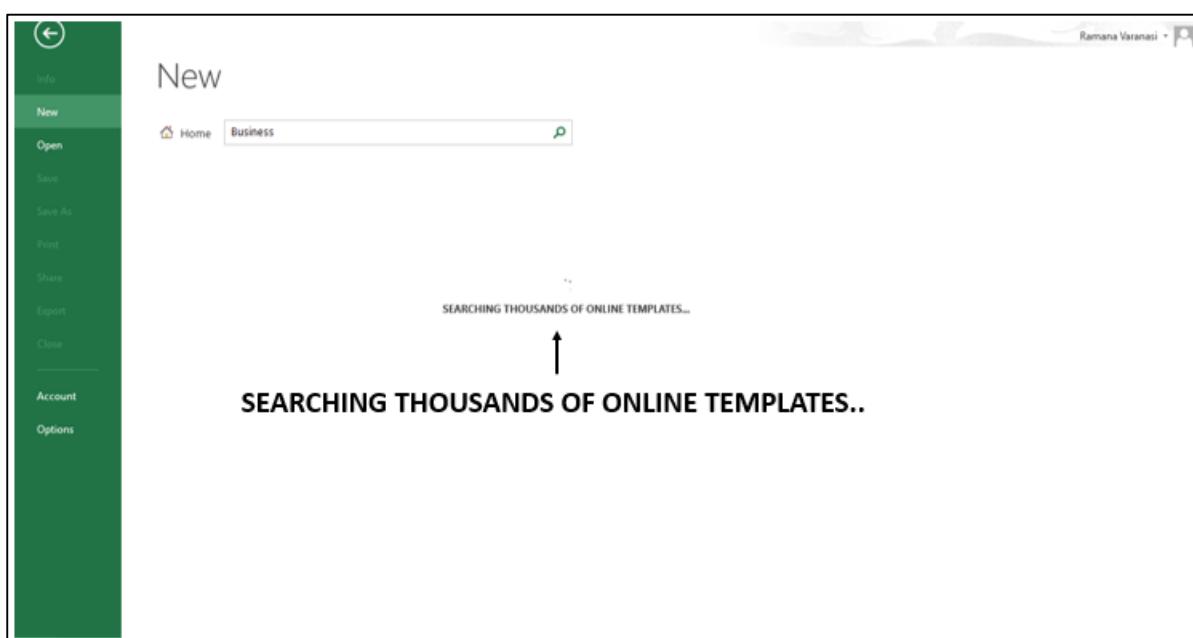
23. Excel – Templates

Excel 2013 has thousands of online Templates of several categories that help you get started quickly by doing most of the set-up and design work for you. You can just focus on your data.

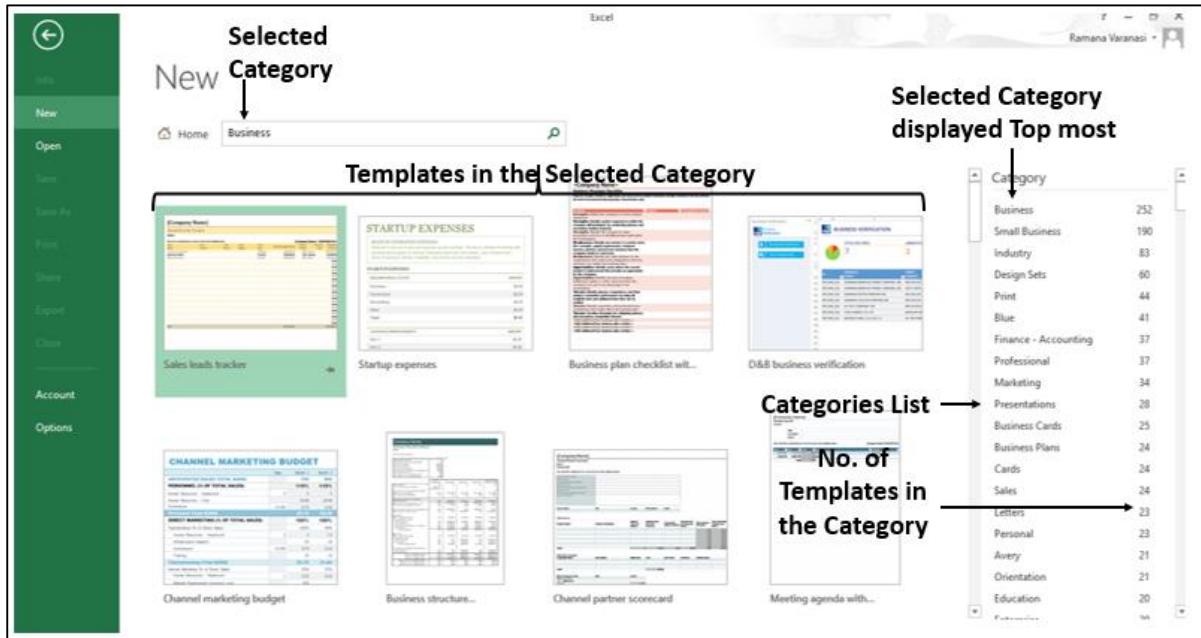
Step 1: Open Excel 2013. You will see many **templates**. You also see a **Search Box** on the **top** and some **Categories** below that.



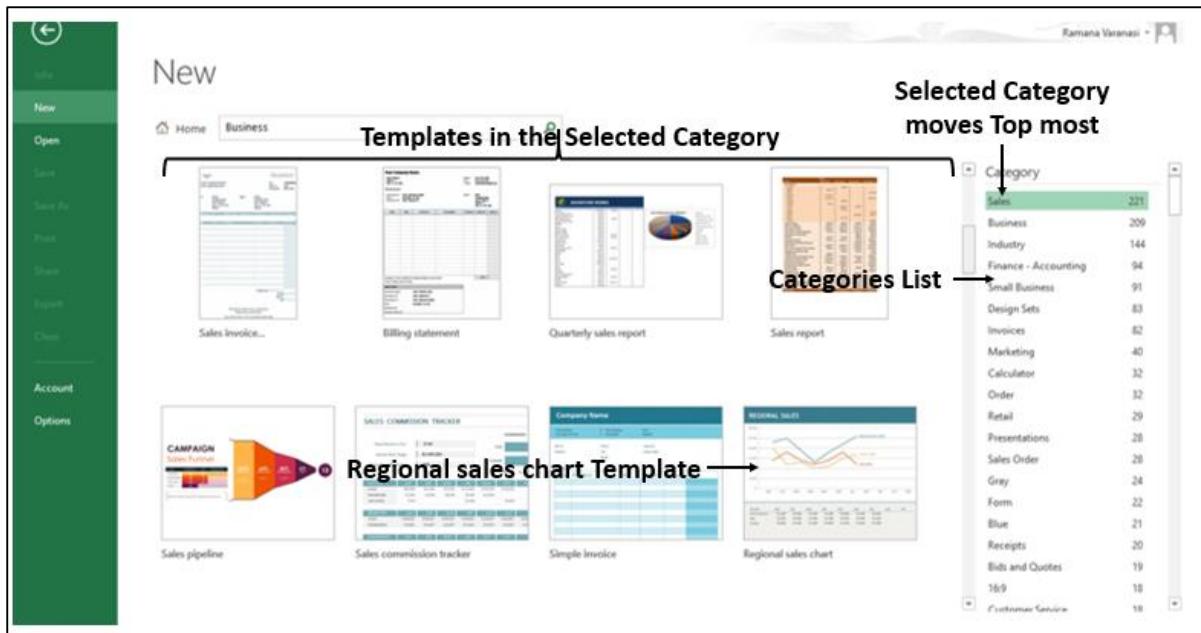
Step 2: Click on the category- **Business**. You will get a message saying **Excel is Searching Thousands of Online Templates**.



All the templates available in the category **Business** will be displayed. Also, all the categories available will be displayed on the right side, with the selected category listed as top most. The list of the categories gives the number of templates in each Category.



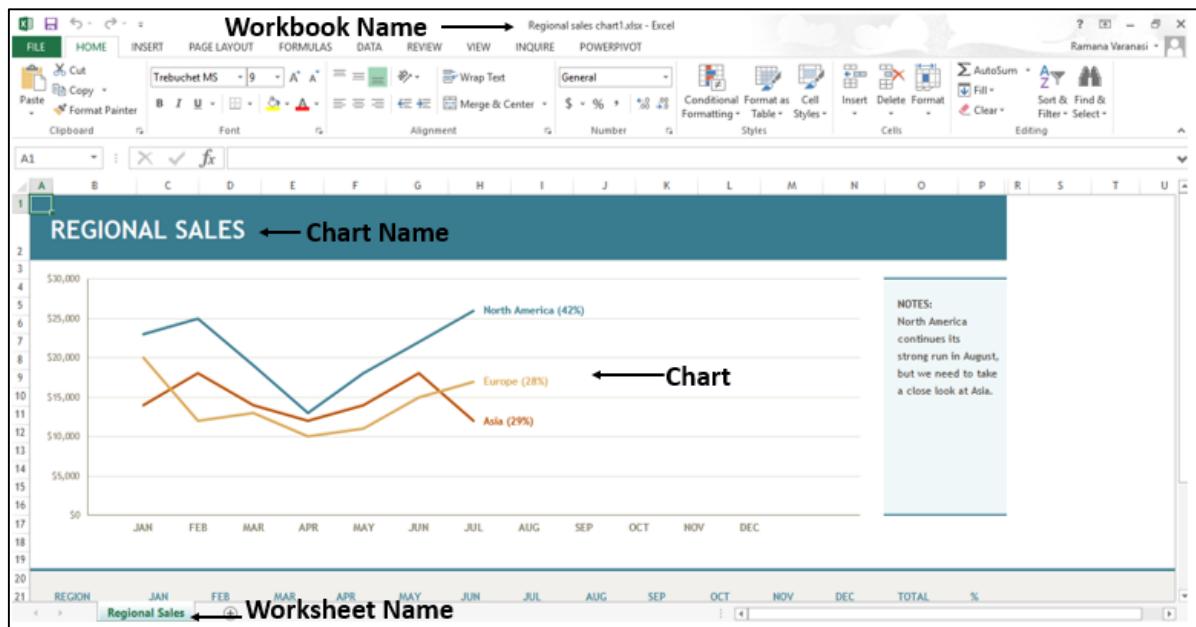
Step 3: Select another Category **Sales** from the Category List on the right side. The Category **Sales** moves up to the top most position in the Category List. The templates of the selected category **Sales** are displayed.



Step 4: Click on **Regional sales chart** Template. A brief description of the template, preview of the template and CREATE button are displayed.

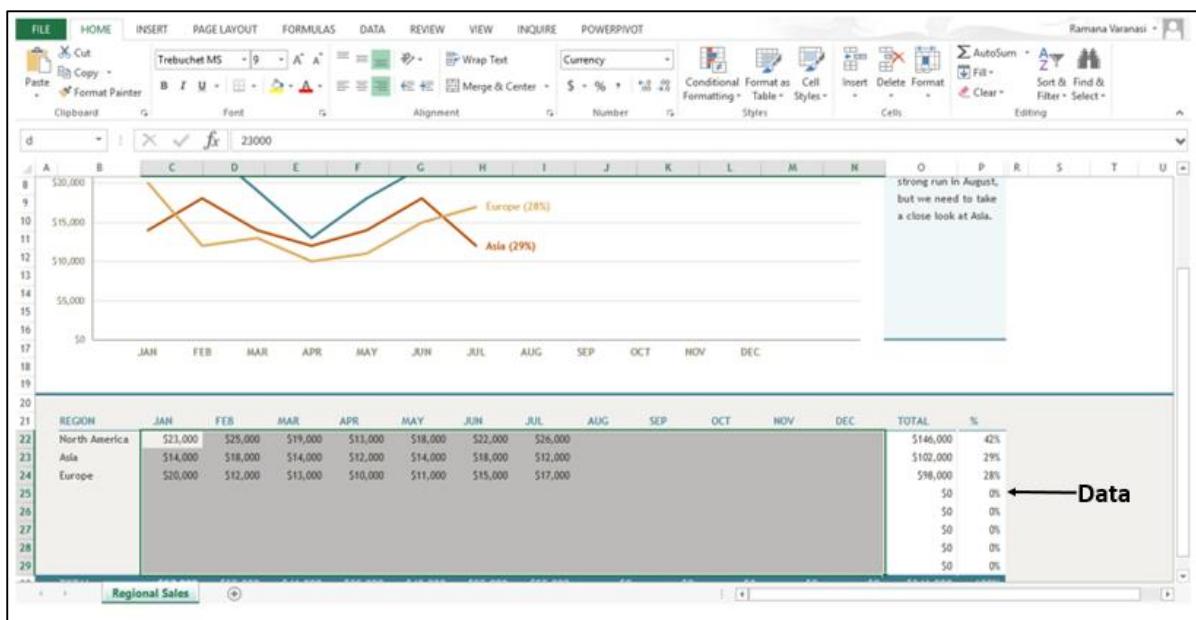


Step 5: Click on **CREATE**. Excel creates a Sample Excel Worksheet with the Template you have chosen and with the sample data.



Note that the **Workbook Name**, **Worksheet Name**, **Chart Name** are also given by Excel appropriately.

Step 6: Replace the data in the worksheet with your data.



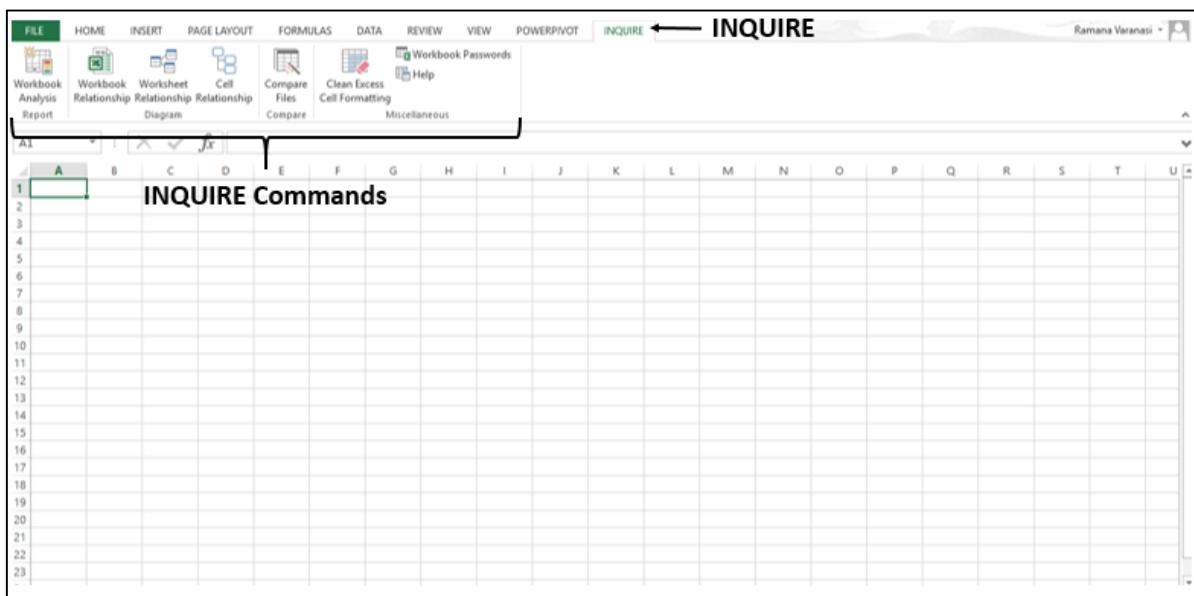
Your Excel Worksheet is ready with mere focus on data.

24. Excel – Inquire

You can use **Inquire** to:

- Compare two Workbooks
- Analyze a Workbook for problems or inconsistencies
- See the links between the Workbooks
- See the links between the Worksheets
- See the Relationships between the cells
- Clean Excess Cell Formatting
- Manage Passwords

The **Inquire tab** is on the **Ribbon**. It has **commands** for all the **tasks** given above.

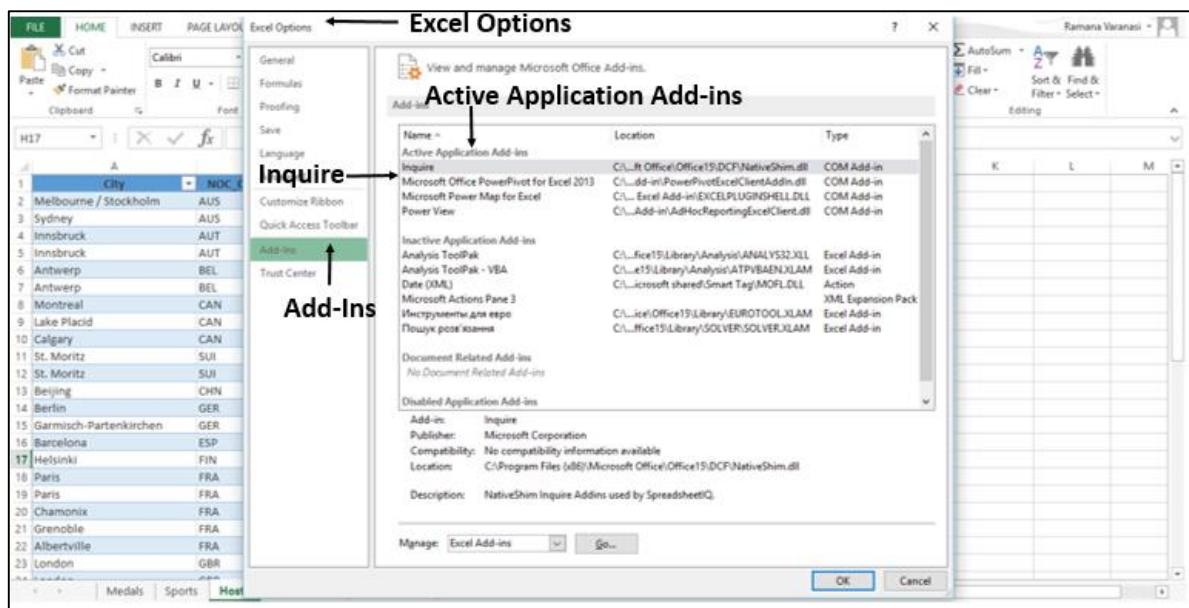


If you do not find the **INQUIRE tab** on the **Ribbon**, you have to ensure that **Inquire Add-in** is Active.

Ensure Inquire Add-in is Active

Step 1: Click on the **File** tab. Click on **Options**.

Step 2: In the **Excel Options** window, click on **Add-Ins**. If **Inquire Add-in** is Active, then it will appear under Active Application Add-ins.

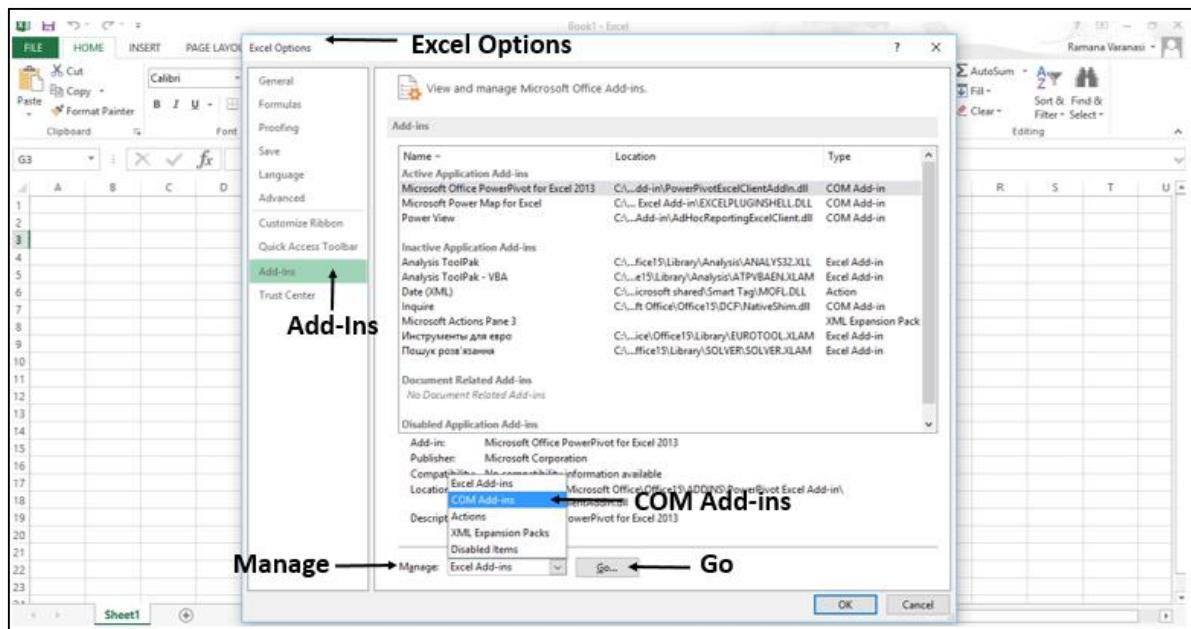


If **Inquire Add-in** is not active, do the following:

Step 3: Click on the **File** tab. Click on **Options**.

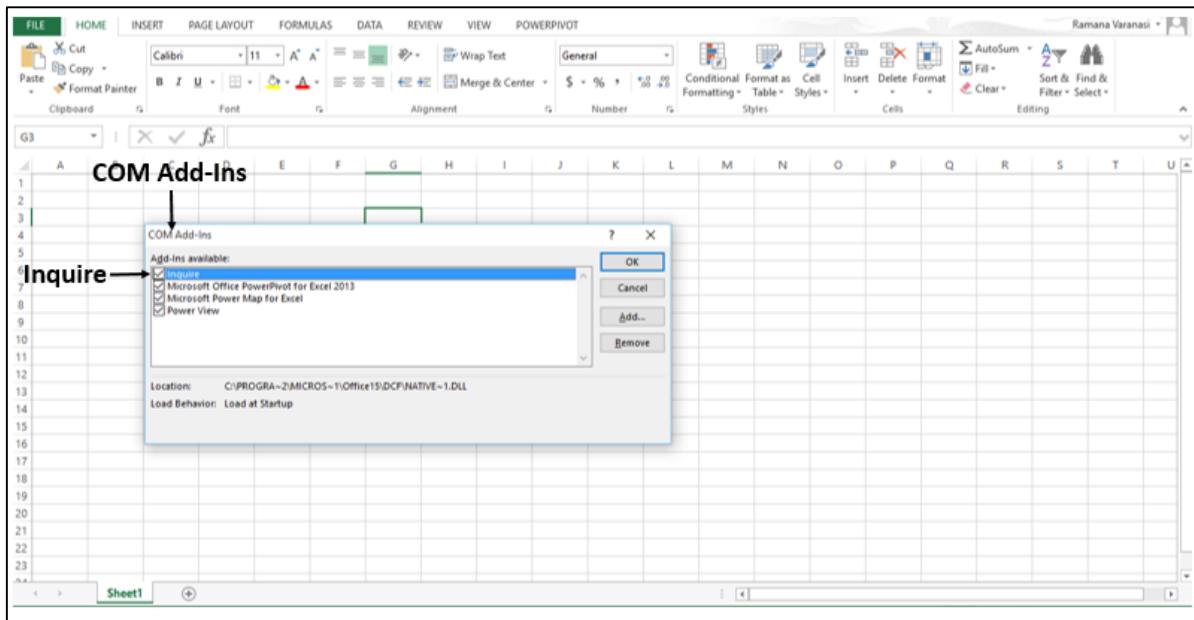
Step 4: In the **Excel Options** Window, click on **Add-Ins**.

Step 5: In the **Manage** Box, Click on **COM Add-ins**.



Step 6: Click on the **Go** Button. The **COM Add-Ins** window appears. You find that **Inquire** is not selected.

Step 7: Select **Inquire** and then click **OK**.



Now, the **Inquire** Add-In is active.

Compare Two Workbooks

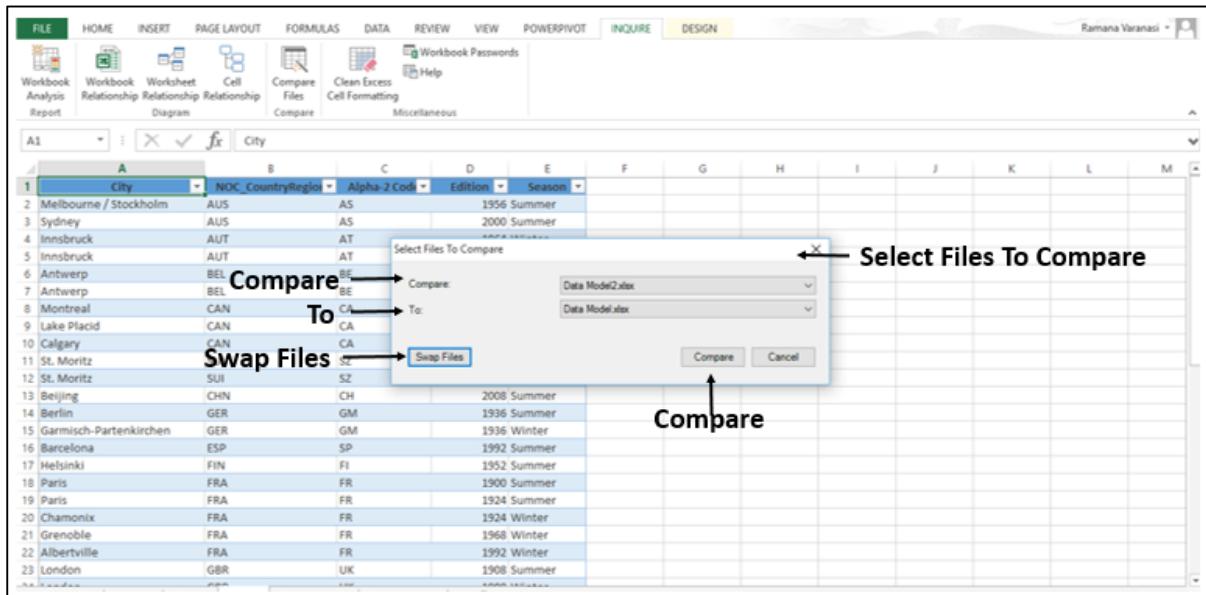
You can compare two workbooks cell by cell and see the differences, if any.

Step 1: Open two Workbooks.

Step 2: Click on the **INQUIRE** tab on the ribbon.

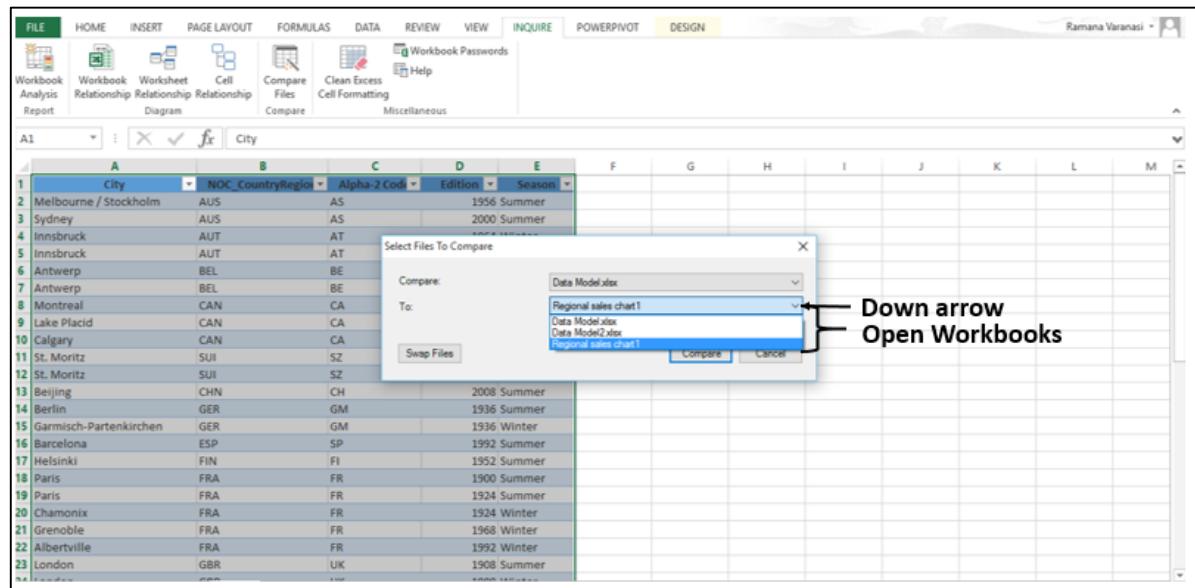
The screenshot shows the Microsoft Excel ribbon with the 'INQUIRE' tab selected. Below the ribbon, there's a toolbar with buttons for Workbook Analysis Report, Workbook Relationship, Worksheet Relationship, Cell Diagram, Compare Files, Clean Excess Cell Formatting, and Help. The main area of the screen displays a table titled 'Compare' with columns: City, NOC_CountryRegion, Alpha-2 Code, Edition, and Season. The table lists various cities and their details, such as Melbourne, Stockholm, Sydney, Innsbruck, Antwerp, Antwerp, Montreal, Lake Placid, Calgary, St. Moritz, St. Moritz, Beijing, Berlin, Garmisch-Partenkirchen, Barcelona, Helsinki, Paris, Paris, Chamonix, Grenoble, Albertville, and London.

Step 3: Click on **Compare Files** in the **Compare** Group. A 'Select Files To Compare' dialog box appears.



Step 4: Check the file names displayed.

Step 5: If the file name displayed is not the one you wanted, click on the down-arrow next to the File name. Only the Workbooks that are open will be displayed.



Step 6: Select the File you want.

Step 7: Check the order of the Files in **Compare** and **To**.

The screenshot shows an Excel spreadsheet with a table of winter Olympic host cities. An 'INQUIRE' tab is selected in the ribbon. A 'Compare' dialog box is open, showing 'Data Model2.xlsx' in the 'Compare' field and 'Data Model.xlsx' in the 'To' field. A 'Swap Files' button is highlighted with a blue box. Arrows point from 'File 1' to 'Data Model2.xlsx' and from 'File 2' to 'Data Model.xlsx'.

Step 8: If it has to be the other way round, click on **Swap Files**. The order of the Files is changed.

The screenshot shows the same Excel spreadsheet and 'INQUIRE' tab. The 'Compare' dialog box now shows 'Data Model.xlsx' in the 'Compare' field and 'Data Model2.xlsx' in the 'To' field. Arrows point from 'File 2' to 'Data Model.xlsx' and from 'File 1' to 'Data Model2.xlsx'.

Step 9: Click on Compare.

The results of the comparison appear in a two-pane grid. The Workbook on the left corresponds to the "Compare" file you chose and the Workbook on the right corresponds to the "To" file. The details appear in a pane below the two grids. The changes are highlighted by color, depending on the kind of change. The legend that shows what the colors mean is in the lower-left pane.

Workbook - Compare

Workbook - To

Details

Changes highlighted by color

Ready - File 1: [Data Model.xlsx] - File 2: [Data Model.xlsx] - Total Displayed Items: 26343

Step 10: Click on Resize Cells to Fit if necessary, to view the cell contents in the 'Compare -To' workbooks.

Resize Cells to Fit

Workbook - Compare

Workbook - To

Resized Cells

Ready - File 1: [Data Model.xlsx] - File 2: [Data Model.xlsx] - Total Displayed Items: 26343

Step 11: Click on the **Export Results** in the **Export Group**.

The screenshot shows the Spreadsheet Compare interface. The ribbon at the top has tabs for Home, Compare, Files, Details, Formulas, View, and Export. The 'Export' tab is highlighted. Below the ribbon is a table titled 'Export Group' with data from two files. To the left of the table is a sidebar with various options like 'Entered Values', 'Calculated Values', 'Formulas', etc., each with checkboxes. On the right side of the table, there is a chart showing the count of different types of values. At the bottom of the window, it says 'Ready - File 1: [Data Model.xlsx] - File 2: [Data Model2.xlsx] - Total Displayed Items: 26343'.

The **Save As** Dialog Box opens.

This screenshot shows the 'Save As' dialog box overlaid on the Spreadsheet Compare interface. The dialog box has 'File name:' and 'Save as type:' dropdowns. The 'Save as type:' dropdown is set to 'Excel Workbook (*.xlsx)'. There are also 'Save' and 'Cancel' buttons. The background shows the same table and chart as the previous screenshot, with the 'Entered Values' option selected in the sidebar.

You can save the results to an Excel Workbook. Note that only **.xlsx** File type is available.

If you need the results in **another program**, you can do it by copying it to the **Clipboard**.

Step 12: Click on **Copy Results to Clipboard** in the **Export** group.

The screenshot shows the 'Spreadsheet Compare' window comparing two Excel files. The ribbon at the top has the 'Home' tab selected. In the 'Clipboard' section of the ribbon, the 'Copy Results to Clipboard' button is highlighted with a red arrow pointing to it. Below the ribbon, there are two tables: 'Medal' and 'Count of Medal'. To the right of the tables is a chart showing medal counts. A sidebar on the left lists various items under 'Enable' with checkboxes, and a 'Change Description' pane on the right details actions taken during the comparison.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Medal	All													
2															
3	Count of Medal	Column Labels													
4	Row Labels	BEL	CAN	CHN	FRA	GER	HUN	ITA	NED	NOR	POL	RUS	URS	USA	Grand Total
5	Aquatics		11	60	1	24	9				24	14	131	274	
6	Diving		11	60	1	24	9				24	14	131	274	
7	Archery	S1		15	46	6	12	9	4	1	7	52	203		
8	Archery	S1		15	46	6	12	9	4	1	7	52	203		
9	Fencing	44		19	283	51	226	328	24	81	41	145	48	1290	
10	Fencing	44		19	283	51	226	328	24	81	41	145	48	1290	

Step 12: Paste in another program.

25. Excel – Workbook Analysis

Workbook Analysis command creates an interactive report showing detailed information about the Workbook and its Structure, Formulas, Cells, Ranges, and Warnings.

Step 1: Click on the Inquire tab on the ribbon.

Step 2: Click on **Workbook** Analysis in the Report group.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Month	Product	State	Sales \$														
2	January	Volcano Blend	California	\$262														
3	January	Turkish Delight Roast	California	\$59														
4	January	Turkish Delight Roast	Oregon	\$887														
5	January	Breakfast Blastoff	Oregon	\$897														
6	January	Best Blend of Arabia	California	\$583														
7	January	Kona Koast	California	\$887														
8	January	Best Blend of Arabia	Oregon	\$423														
9	January	Breakfast Blastoff Decaf	Oregon	\$860														
10	February	Breakfast Blastoff Decaf	Washington	\$572														
11	February	Breakfast Blastoff	Washington	\$609														
12	February	Turkish Delight Roast	California	\$474														
13	February	Kona Koast	California	\$897														
14	February	Best Blend of Arabia	California	\$365														
15	February	Volcano Blend	California	\$549														
16	February	Breakfast Blastoff Decaf	Oregon	\$365														
17	February	Breakfast Blastoff	Oregon	\$592														
18	February	Turkish Delight Roast	Oregon	\$39														
19	February	Kona Koast	Oregon	\$609														
20	February	Best Blend of Arabia	Oregon	\$242														
21	February	Volcano Blend	Oregon	\$312														
22	February	Breakfast Blastoff Decaf	Washington	\$205														
23	February	Breakfast Blastoff	Washington	\$429														
24	February	Turkish Delight Roast	Washington	\$729														
25	February	Kona Koast	Washington	\$259														
26	February	Best Blend of Arabia	Washington	\$42														
27	February	Volcano Blend	Washington	\$171														
28	March	Breakfast Blastoff Decaf	California	\$153														

The **Report** will be displayed after the **Workbook Analysis** is completed.

Items

- Summary
 - Workbook
 - Linked workbooks (0)
 - DDE links (0)
 - Data connections (0)
 - Visible sheets (2)
 - Hidden sheets (0)
 - Very hidden sheets (0)
 - Formulas
 - All formulas (224)
 - Array formulas (0)
 - With errors (0)
 - With logical values (0)
 - With numeric values (224)
 - With date/time values (0)
 - With textual values (0)
 - With numeric constants (224)
 - With textual constants (0)

Results

Export

Item detail limit: 250000 (don't export details if more than this number of results are found for a given item)

Excel Export...

The Report has six categories:

- **Summary:** General information about the structure and content of the Workbook.
- **Workbook (with subcategories):** General Workbook Statistics.
- **Formulas (with subcategories):** Specific information about formulas in the Workbook.
- **Cells (with subcategories):** Specific information about the cells in the Workbook.
- **Ranges (with subcategories):** Specific information about the ranges in the Workbook.
- **Warnings:** Several types of warnings about the Workbook structure and content.

Items

- Summary**
- Workbook
- Formulas
- Cells
- Ranges
- Warnings (1)

Result

Export

Item detail limit: 250000 (don't export details if more than this number of results are found for a given item)

Excel Export...

Selecting a **Category** gives you more information about that Category.

Step 3: Click on the Formulas category. Sub-Categories of the formulas will be displayed.

Sub-Categories of Formulas

Item	Sheet Name	Cell Address	Formula
1	Database	D2	=RAND()*1000
2	Database	D3	=RAND()*1000
3	Database	D4	=RAND()*1000
4	Database	D5	=RAND()*1000
5	Database	D6	=RAND()*1000
6	Database	D7	=RAND()*1000
7	Database	D8	=RAND()*1000
8	Database	D9	=RAND()*1000
9	Database	D10	=RAND()*1000
10	Database	D11	=RAND()*1000
11	Database	D12	=RAND()*1000
12	Database	D13	=RAND()*1000
13	Database	D14	=RAND()*1000
14	Database	D15	=RAND()*1000
15	Database	D16	=RAND()*1000
16	Database	D17	=RAND()*1000

For example,

- All formulas are 224 in number.
- With numeric values are 224 in number.

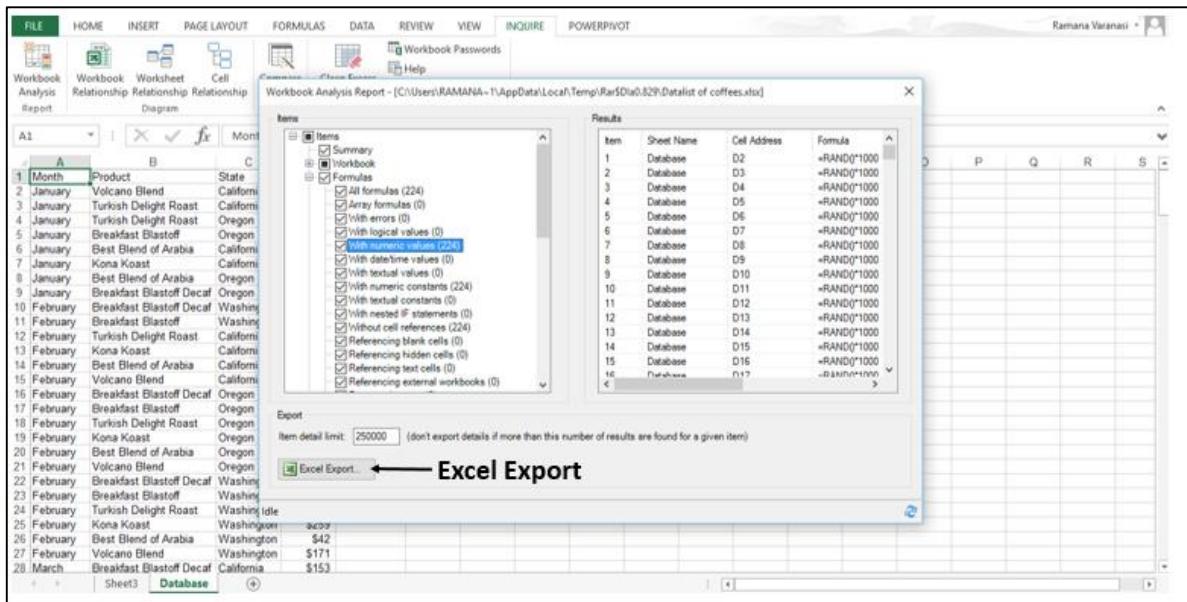
Step 4: Click on a Sub-Category. For example, click "With numeric values".

With numeric values (224)

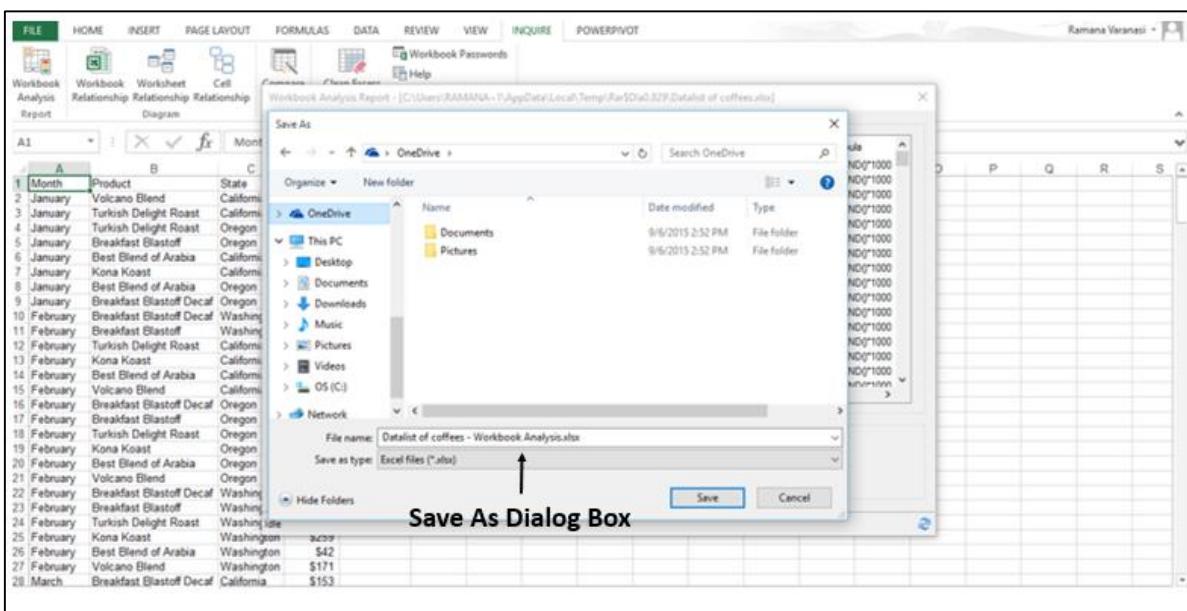
Item → **Sheet Name** → **Cell Address** → **Formula**

Item	Sheet Name	Cell Address	Formula
1	Database	D2	=RAND()*1000
2	Database	D3	=RAND()*1000
3	Database	D4	=RAND()*1000
4	Database	D5	=RAND()*1000
5	Database	D6	=RAND()*1000
6	Database	D7	=RAND()*1000
7	Database	D8	=RAND()*1000
8	Database	D9	=RAND()*1000
9	Database	D10	=RAND()*1000
10	Database	D11	=RAND()*1000
11	Database	D12	=RAND()*1000
12	Database	D13	=RAND()*1000
13	Database	D14	=RAND()*1000
14	Database	D15	=RAND()*1000
15	Database	D16	=RAND()*1000
16	Database	D17	=RAND()*1000

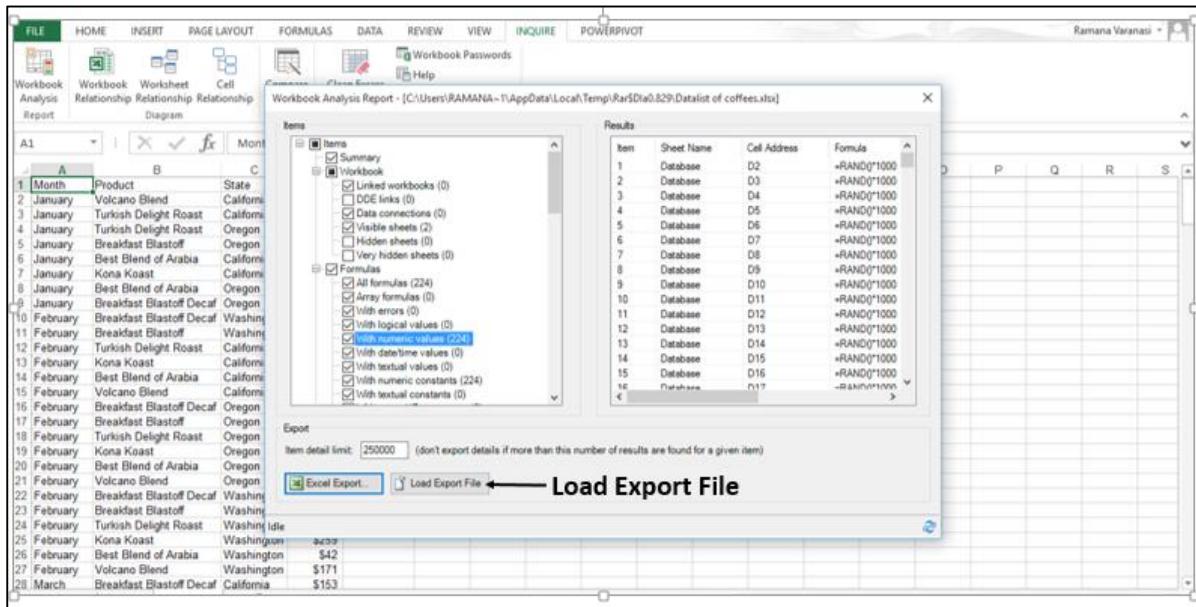
Step 5: Click on the Excel Export button.



The Save As Dialog Box opens.



Step 6: Save the **Report** as an Excel Workbook. A **Load Export File** button appears next to **Excel Export** button.



Step 7: Click on the **Load Export File** button. The saved Report Excel Workbook opens.

Sheet Name	Cell Address	Formula	Value	Reviewer	Comments
Database	D2	=RAND()*1000	390.1685456		
Database	D3	=RAND()*1000	755.3002887		
Database	D4	=RAND()*1000	207.1932518		
Database	D5	=RAND()*1000	877.8786998		
Database	D6	=RAND()*1000	578.700364		
Database	D7	=RAND()*1000	547.2528243		
Database	D8	=RAND()*1000	934.7960261		
Database	D9	=RAND()*1000	189.2499802		
Database	D10	=RAND()*1000	38.65181928		
Database	D11	=RAND()*1000	830.2913624		
Database	D12	=RAND()*1000	427.7282572		
Database	D13	=RAND()*1000	179.6895305		
Database	D14	=RAND()*1000	515.3265906		
Database	D15	=RAND()*1000	168.5673635		
Database	D16	=RAND()*1000	950.8895917		
Database	D17	=RAND()*1000	287.6123121		
Database	D18	=RAND()*1000	495.4253243		
Database	D19	=RAND()*1000	327.3820795		
Database	D20	=RAND()*1000	952.9200188		

Diagrams

In the **Diagram** group, under the **INQUIRE** tab, three types of diagrams are available.

- Workbook Relationship
- Worksheet Relationship
- Cell Relationship

They are interactive diagrams created by links. The links show the dependencies between the nodes in the diagram. You can drag the links or nodes to arrange them and align them to view whatever you are looking for.

Workbook Relationship

You can use the **Workbook Relationship** diagram to create an interactive, graphical map of Workbook dependencies created by connections (links) between files.

The types of links in the diagram can include other Workbooks, Access databases, text files, HTML pages, SQL Server databases, and other data sources.

Step 1: Click on the **INQUIRE** tab on the ribbon.

Step 2: Click on **Workbook Relationship** in the **Diagram** group.

Discipline	DisciplineID	SportID
Rowing	D46	S32
Short Track S.	D50	S36
Eventing	D24	S16
Polo	D42	S29
Archery	D2	S2
Wrestling Free.	D69	S47
Alpine Skiing	D1	S37
Shooting	D49	S35
Water polo	D67	S1
Cycling Road	D20	S15
Cricket	D16	S12
Freestyle Ski.	D71	S37
Volleyball	D65	S44
Football	D28	S18
Bobsleigh	D12	S9
Dressage	D23	S16
Basque Pelota	D8	S7
Handball	D30	S21
Table Tennis	D58	S39
Luge	D38	S27
Jeu de Paume	D34	S24
Tennis	D60	S41

The Workbook Relationship Diagram appears, showing its links with different Data Sources.

Linked Workbook → sports.xlsx

Source Workbook → WKBk RelDiag.xlsx

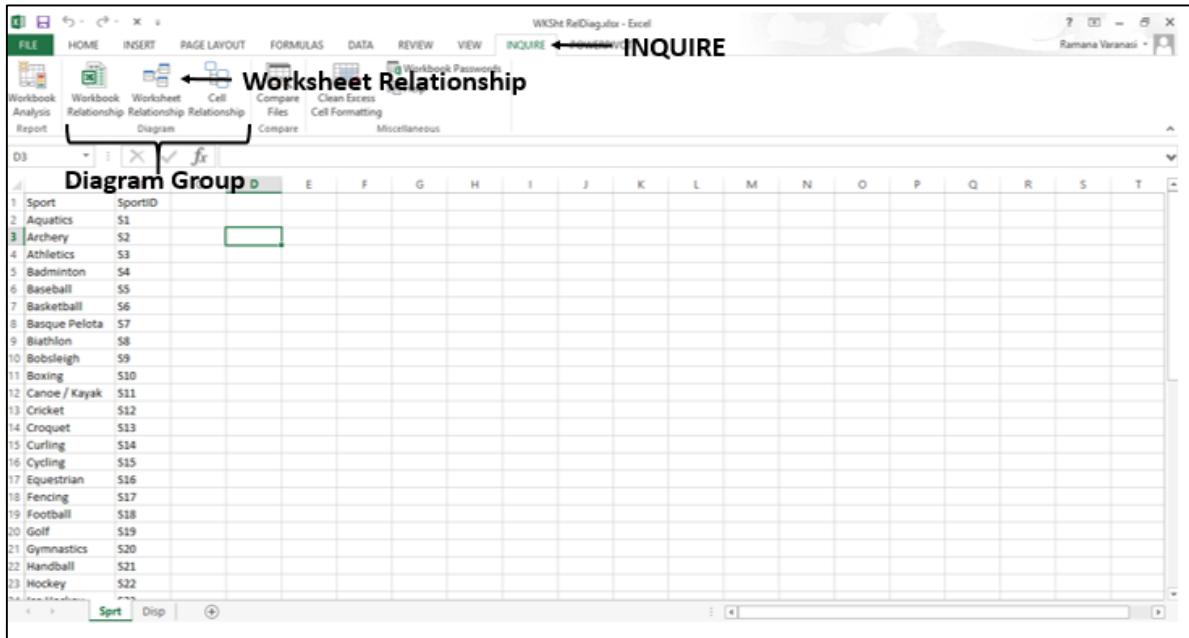
Linked Workbook with Data Connection to Access Database → Events.xlsx

Worksheet Relationship

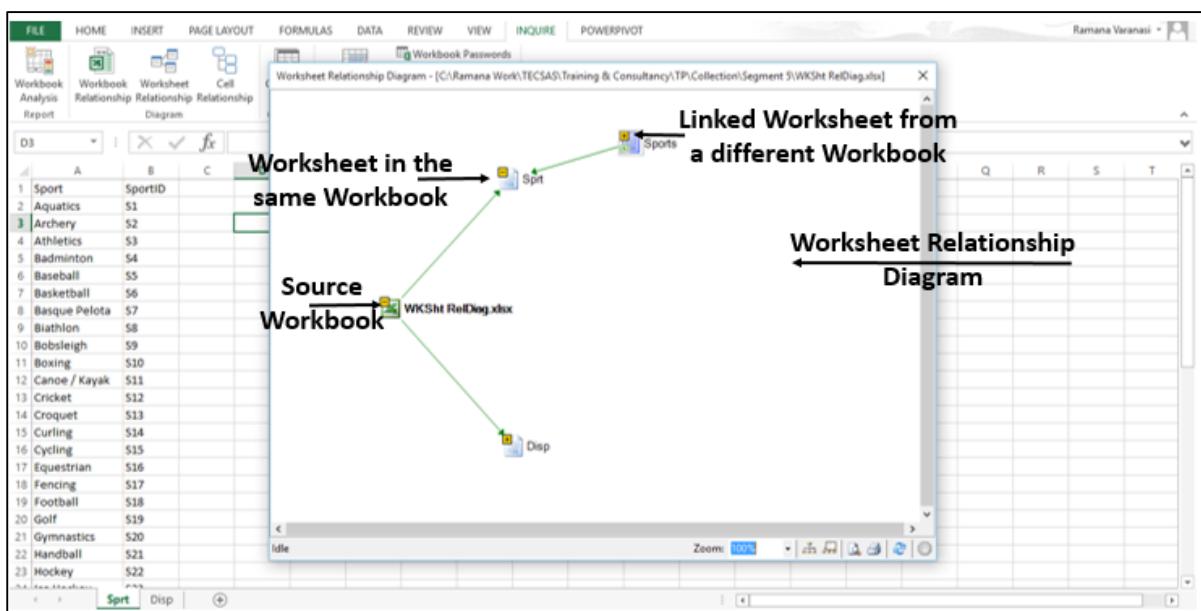
You can use **Worksheet Relationship** Diagram to create an interactive, graphical map of connections (links) between Worksheets in the same Workbook and /or Worksheets in other Workbooks.

Step 1: Click on the **INQUIRE** tab on the ribbon.

Step 2: Click on **Worksheet Relationship** in the Diagram Group.



The **Worksheet Relationship** Diagram appears, showing the links between the Worksheets in the same Workbook and in other Workbooks.



Cell Relationship

You can use the **Cell Relationship** Diagram to get a detailed, interactive diagram of all links from a selected cell to cells in other worksheets or even other workbooks.

Step 1: Click on the **INQUIRE** tab on the ribbon.

Step 2: Click on **Cell Relationship** in the **Diagram** group.

Menu Item	Price	Quantity	Sales Tax	Total
Empanadas: Beef Picadillo	\$2.99	15	\$3.59	\$48.44
Empanadas: Chipotle Shrimp	\$3.99	10	\$3.19	\$43.09
Empanadas: Black Bean & Plantain	\$2.49	20	\$3.98	\$53.78
Tamales: Chicken Tinga	\$2.29	20	\$3.66	\$49.46
Tamales: Vegetable	\$2.29	30	\$5.50	\$74.20
Arepas: Carnitas	\$2.89	10	\$2.31	\$31.21
Arepas: Queso Blanco	\$2.49	20	\$3.98	\$53.78
Empanadas: Apple Cinnamon	\$3.19	40	\$10.21	\$137.81
Beverages: Horchata	\$1.89	25	\$3.78	\$51.03
Beverages: Lemonade	\$1.89	35	\$5.29	\$71.44
Beverages: Tamarindo	\$1.89	10	\$1.51	\$20.41
Total				\$634.66

The **Cell Relationship Diagram** options window appears.

Cell Relationship Diagram Options

Data options

Span sheets

Span workbooks

Trace cell precedents

Trace cell dependents

Trace both

Initial number of expansion levels

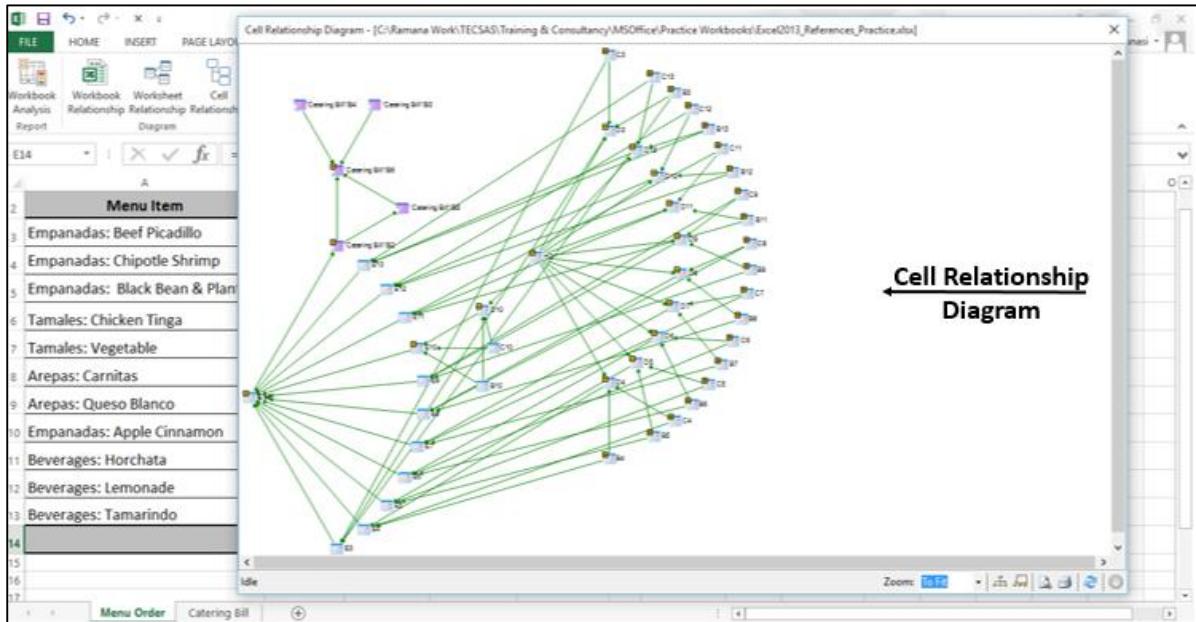
Limited 5

All

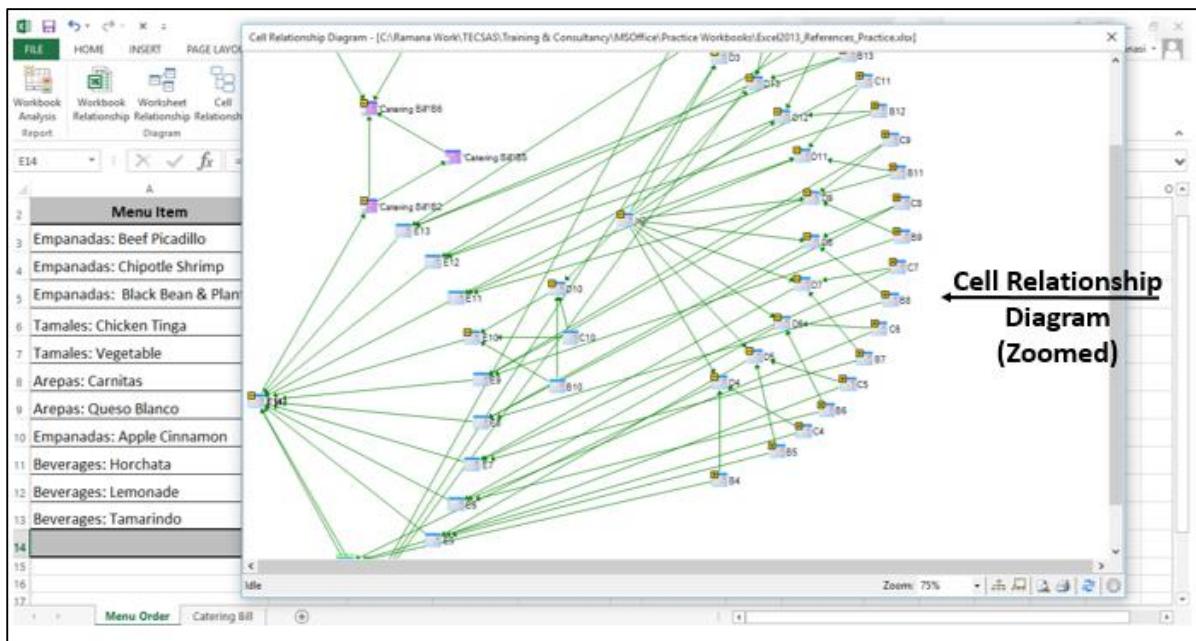
Step 3: Select the options.

Step 4: Click **OK**.

The **Cell Relationship Diagram** appears, showing links between the Selected Cell and the Cells in the same Worksheet, same Workbook and in other Workbooks, based on the options you have chosen.



Step 5: Click on Zoom.



You can view the nodes clearly.

Clean Excess Cell Formatting

When a Workbook loads slowly, or has become huge, it might have formatting applied to rows or columns you are not aware of.

You can use the **Clean Excess Cell Formatting** command to remove the excess formatting and greatly reduce the file size. This reduces file size and improves your Excel's speed.

But, you may want to make a backup copy of your file before cleaning the excess cell formatting, because there are certain cases where this process may increase your file size, and there is no way to undo the change.

Step 1: Click on the **INQUIRE** tab on the ribbon.

Step 2: Click on **Clean Excess Cell Formatting** in the **Miscellaneous** Group.

The screenshot shows the Microsoft Excel ribbon with the 'INQUIRE' tab selected. Below the ribbon, a table is displayed with data for various menu items. The 'Miscellaneous' group on the ribbon is expanded, and the 'Clean Excess Cell Formatting' button is highlighted with a red arrow pointing to it.

Menu Item	Price	Quantity	Sales Tax	Total
Empanadas: Beef Picadillo	\$2.99	15	\$3.59	\$48.44
Empanadas: Chipotle Shrimp	\$3.99	10	\$3.19	\$43.09
Empanadas: Black Bean & Plantain	\$2.49	20	\$3.98	\$53.78
Tamales: Chicken Tinga	\$2.29	20	\$3.66	\$49.46
Tamales: Vegetable	\$2.29	30	\$5.50	\$74.20
Arepas: Carnitas	\$2.89	10	\$2.31	\$31.21
Arepas: Queso Blanco	\$2.49	20	\$3.98	\$53.78
Empanadas: Apple Cinnamon	\$3.19	40	\$10.21	\$137.81
Beverages: Horchata	\$1.89	25	\$3.78	\$51.03
Beverages: Lemonade	\$1.89	35	\$5.29	\$71.44
Beverages: Tamarindo	\$1.89	10	\$1.51	\$20.41
			Total	\$634.66

The **Clean Excess Cell Formatting** Dialog Box appears.

Clean Excess Cell Formatting Dialog Box

Menu Item	Price	Quantity	Sales Tax	Total	Sales Tax	8.0%
Empanadas: Beef Picadillo	\$2.99	15		\$10.21	\$137.81	
Empanadas: Chipotle Shrimp	\$3.99	10		\$3.78	\$51.03	
Empanadas: Black Bean & Plantain	\$2.49	20		\$5.29	\$71.44	
Tamales: Chicken Tinga	\$2.29	20		\$1.51	\$20.41	
Tamales: Vegetable	\$2.29	30				
Arepas: Carnitas	\$2.89	10				
Arepas: Queso Blanco	\$2.49	20				
Empanadas: Apple Cinnamon	\$3.19	40				
Beverages: Horchata	\$1.89	25				
Beverages: Lemonade	\$1.89	35				
Beverages: Tamarindo	\$1.89	10				
			Total	\$634.66		

Step 3: Choose **All Sheets** in the **Apply to** box. You will get a message about saving the changes made.

Would you like to save your changes to the cleaned sheets?

Menu Item	Price	Quantity	Sales Tax	Total	Sales Tax	8.0%
Empanadas: Beef Picadillo	\$2.99	15		\$10.21	\$137.81	
Empanadas: Chipotle Shrimp	\$3.99	10		\$3.78	\$51.03	
Empanadas: Black Bean & Plantain	\$2.49	20		\$5.29	\$71.44	
Tamales: Chicken Tinga	\$2.29	20		\$1.51	\$20.41	
Tamales: Vegetable	\$2.29	30				
Arepas: Carnitas	\$2.89	10				
Arepas: Queso Blanco	\$2.49	20				
Empanadas: Apple Cinnamon	\$3.19	40				
Beverages: Horchata	\$1.89	25				
Beverages: Lemonade	\$1.89	35				
Beverages: Tamarindo	\$1.89	10				
			Total	\$634.66		

Step 4: Click **OK**.

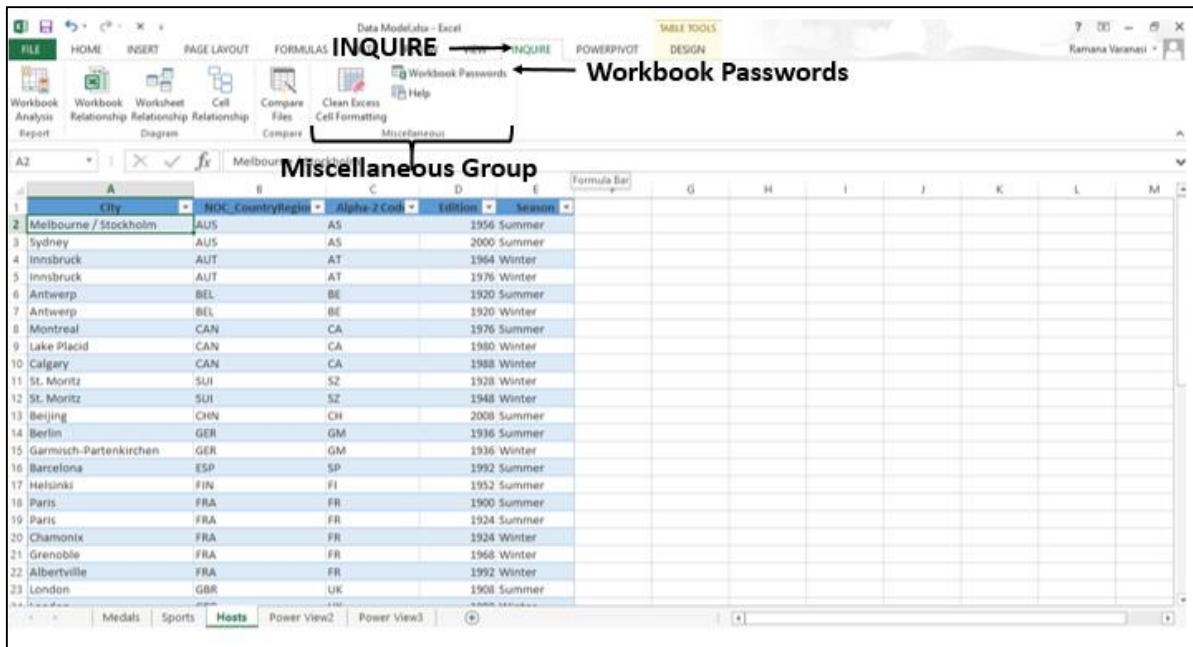
26. Excel – Manage Passwords

If you are using **Workbook Analysis** or **Compare Files** commands for Workbooks that are password-protected, you can avoid having to type the password each time those files are opened.

Excel 2013 has a **Password Manager**, which can be accessed through the **Workbook Passwords** Command.

Step 1: Click on the **INQUIRE** tab on the **ribbon**.

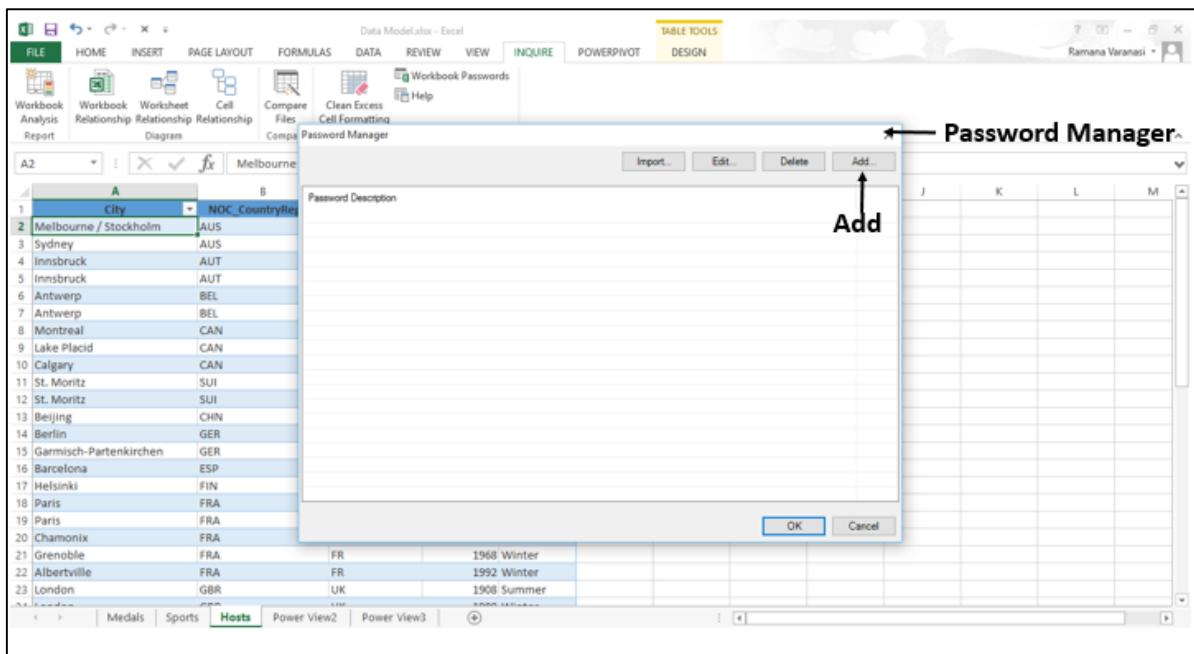
Step 2: Click on **Workbook Passwords** in the Miscellaneous Group.



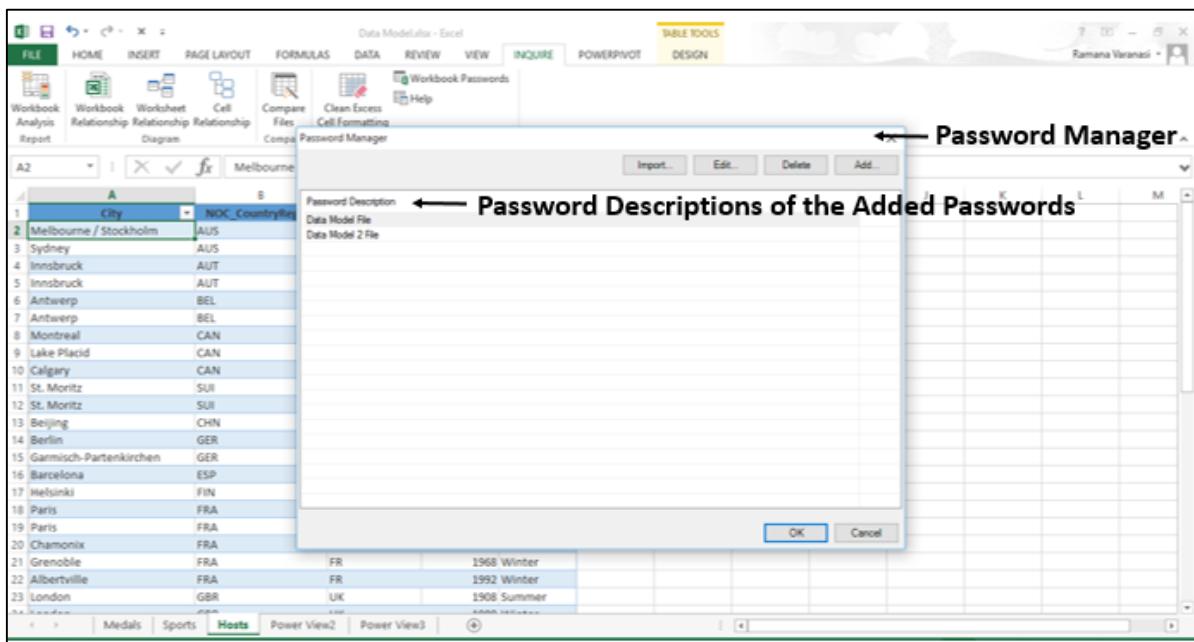
The screenshot shows the Microsoft Excel ribbon with the 'INQUIRE' tab selected. A callout arrow points from the 'Miscellaneous' button in the ribbon to the 'Workbook Passwords' option in the 'INQUIRE' dropdown menu. The main window displays a table of data with columns: City, NOC, CountryRegion, Alpha-2 Code, Edition, and Season.

A	B	C	D	E
City	NOC_CountryRegion	Alpha-2 Code	Edition	Season
1 Melbourne / Stockholm	AUS	AS	1956 Summer	
2 Sydney	AUS	AS	2000 Summer	
3 Innsbruck	AUT	AT	1964 Winter	
4 Innsbruck	AUT	AT	1976 Winter	
5 Antwerp	BEL	BE	1920 Summer	
6 Antwerp	BEL	BE	1920 Winter	
7 Montreal	CAN	CA	1976 Summer	
8 Lake Placid	CAN	CA	1980 Winter	
9 Calgary	CAN	CA	1988 Winter	
10 St. Moritz	SUI	SZ	1928 Winter	
11 St. Moritz	SUI	SZ	1948 Winter	
12 Berlin	CHN	CH	2008 Summer	
13 Beijing	GER	GM	1936 Summer	
14 Berlin	GER	GM	1936 Winter	
15 Garmisch-Partenkirchen	ESP	SP	1992 Summer	
16 Barcelona	FIN	FI	1952 Summer	
17 Helsinki	FRA	FR	1900 Summer	
18 Paris	FRA	FR	1924 Summer	
19 Paris	FRA	FR	1924 Winter	
20 Chamonix	FRA	FR	1968 Winter	
21 Grenoble	FRA	FR	1992 Winter	
22 Albertville	GBR	UK	1908 Summer	
23 London				

The **Password Manager** window opens.



Step 3: Add passwords of your Workbooks. Add password descriptions also.



Embed Worksheet Data in a Web Page

To share a part of your worksheet on the web, you can simply embed it on your web page. Other people can then work with the data in **Excel Online** or open the embedded data in Excel.

Share an Excel worksheet in an online meeting

You can present your Workbook online if you have the **Lync** installed.

Step 1: Close all the Workbooks that you do not want to share and keep only the Workbook you want to share Open.

Step 2: Click on the **File menu**.

Step 3: Click on the option-**Share**.

Step 4: Click on **Present Online**.

Step 5: Under the option- **Present Online**, click **Present**.

Step 6: In the Share Workbook Window, pick a scheduled meeting or click **Start a new Lync meeting**, and then click **OK**.

Step 7: To stop sharing, click **Stop Sharing** at the top of the screen. You can present your Workbook online if you have a Skype Account also. Microsoft is introducing Skype for Business.

27. Excel – File Formats

Save a Workbook in another File Format

When you save an Excel 2013 Workbook, by default it saves in the **.xlsx** format. Excel 2013 supports saving in other formats, but whenever you save a workbook in another file format, some of its formatting, data, and features might not be saved.

File Formats (File Types) that are supported in Excel 2013:

- Excel File Formats
- Text File Formats
- Other File Formats

Excel File Formats

Format	Extension	Description
Excel Workbook	.xlsx	The default XML-based file format for Excel 2007-2013. Cannot store Microsoft Visual Basic for Applications (VBA) macro code or Microsoft Office Excel 4.0 macro sheets (.xlm).
Strict Open XML Spreadsheet	.xlsx	An ISO strict version of the Excel Workbook file format (.xlsx).
Excel Workbook (code)	.xlsm	The XML-based and macro-enabled file format for Excel 2007-2013. Stores VBA macro code or Excel 4.0 macro sheets (.xlm).
Excel Binary Workbook	.xlsb	The binary file format (BIFF12) for Excel 2007-2013.
Template	.xltx	The default file format for an Excel template for Excel 2007-2013. Cannot store VBA macro code or Excel 4.0 macro sheets (.xlm).
Template (code)	.xltm	The macro-enabled file format for an Excel template in Excel 2007-2013. Stores VBA macro code or Excel 4.0 macro sheets (.xlm).
Excel 97- Excel 2003 Workbook	.xls	The Excel 97 - Excel 2003 Binary file format (BIFF8).

Format	Extension	Description
Excel 97- Excel 2003 Template	.xlt	The Excel 97 - Excel 2003 Binary file format (BIFF8) for an Excel template.
Microsoft Excel 5.0/95 Workbook	.xls	The Excel 5.0/95 Binary file format (BIFF5).
XML Spreadsheet 2003	.xml	XML Spreadsheet 2003 file format (XMLSS).
XML Data	.xml	XML Data format.
Excel Add-In	.xlam	The XML-based and macro-enabled Add-In format for Excel 2007-2013. An Add-In is a supplemental program that is designed to run additional code. Supports the use of VBA projects and Excel 4.0 macro sheets (.xlm).
Excel 97-2003 Add-In	.xla	The Excel 97-2003 Add-In, a supplemental program that is designed to run additional code. Supports the use of VBA projects.
Excel 4.0 Workbook	.xlw	An Excel 4.0 file format that saves only worksheets, chart sheets, and macro sheets. You can open a workbook in this file format in Excel 2013, but you cannot save an Excel file to this file format.

Text File Formats

If you save a workbook in any text format, all formatting is lost.

Format	Extension	Description
Formatted Text (Space-delimited)	.prn	Lotus space-delimited format. Saves only the active sheet.
Text (Tab-delimited)	.txt	Saves a workbook as a tab-delimited text file for use on another Microsoft Windows operating system, and ensures that tab characters, line breaks, and other characters are interpreted correctly. Saves only the active sheet.
Text (Macintosh)	.txt	Saves a workbook as a tab-delimited text file for use on the Macintosh operating system, and ensures that tab

Format	Extension	Description
		characters, line breaks, and other characters are interpreted correctly. Saves only the active sheet.
Text (MS-DOS)	.txt	Saves a workbook as a tab-delimited text file for use on the MS-DOS operating system, and ensures that tab characters, line breaks, and other characters are interpreted correctly. Saves only the active sheet.
Unicode Text	.txt	Saves a workbook as Unicode text, a character encoding standard that was developed by the Unicode Consortium.
CSV (comma delimited)	.csv	Saves a workbook as a comma-delimited text file for use on another Windows operating system, and ensures that tab characters, line breaks, and other characters are interpreted correctly. Saves only the active sheet.
CSV (Macintosh)	.csv	Saves a workbook as a comma-delimited text file for use on the Macintosh operating system, and ensures that tab characters, line breaks, and other characters are interpreted correctly. Saves only the active sheet.
CSV (MS-DOS)	.csv	Saves a workbook as a comma-delimited text file for use on the MS-DOS operating system, and ensures that tab characters, line breaks, and other characters are interpreted correctly. Saves only the active sheet.
DIF	.dif	Data Interchange Format. Saves only the active sheet.
SYLK	.slk	Symbolic Link Format. Saves only the active sheet.

Other File Formats

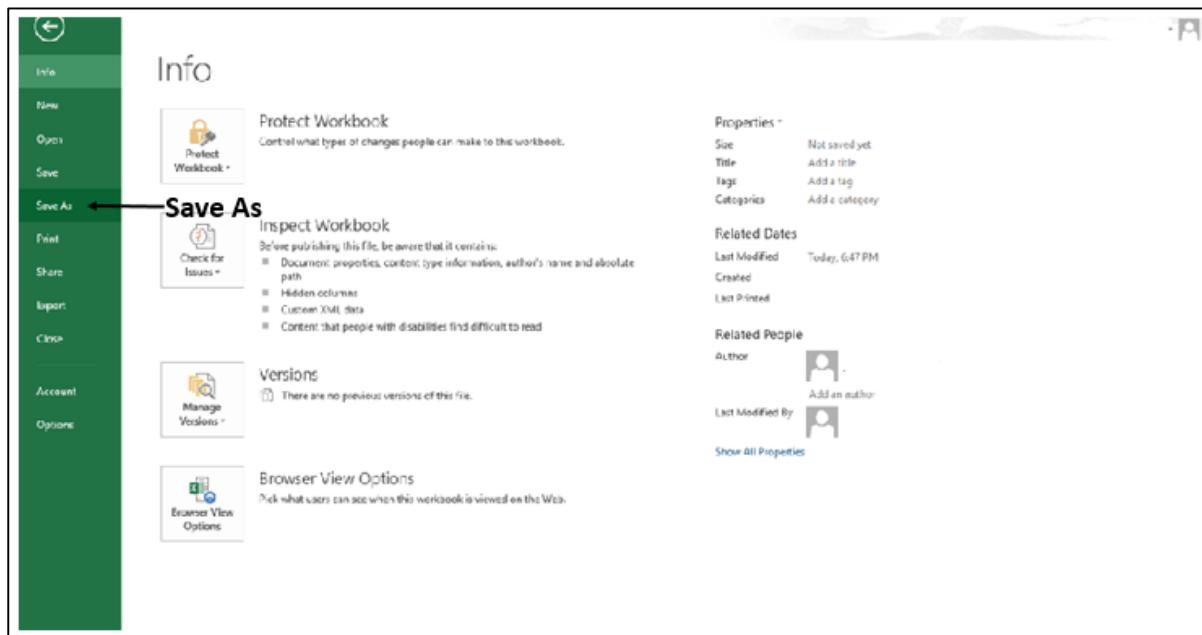
Format	Extension	Description
DBF 3, DBF 4	.dbf	dBase III and IV. You can open these files formats in Excel, but you cannot save an Excel file to dBase format.
OpenDocument Spreadsheet	.ods	OpenDocument Spreadsheet. You can save Excel 2010 files so they can be opened in spreadsheet applications that use the OpenDocument Spreadsheet format, such as Google Docs and OpenOffice.org Calc. You can also open spreadsheets in the .ods format in Excel 2010. Formatting might be lost when saving and opening .ods files.

Format	Extension	Description
PDF	.pdf	Portable Document Format (PDF). This file format preserves document formatting and enables file sharing. When the PDF format file is viewed online or printed, it retains the format that you intended. Data in the file cannot be easily changed. The PDF format is also useful for documents that will be reproduced by using commercial printing methods.
XPS Document	.xps	XML Paper Specification (XPS). This file format preserves document formatting and enables file sharing. When the XPS file is viewed online or printed, it retains exactly the format that you intended, and the data in the file cannot be easily changed.

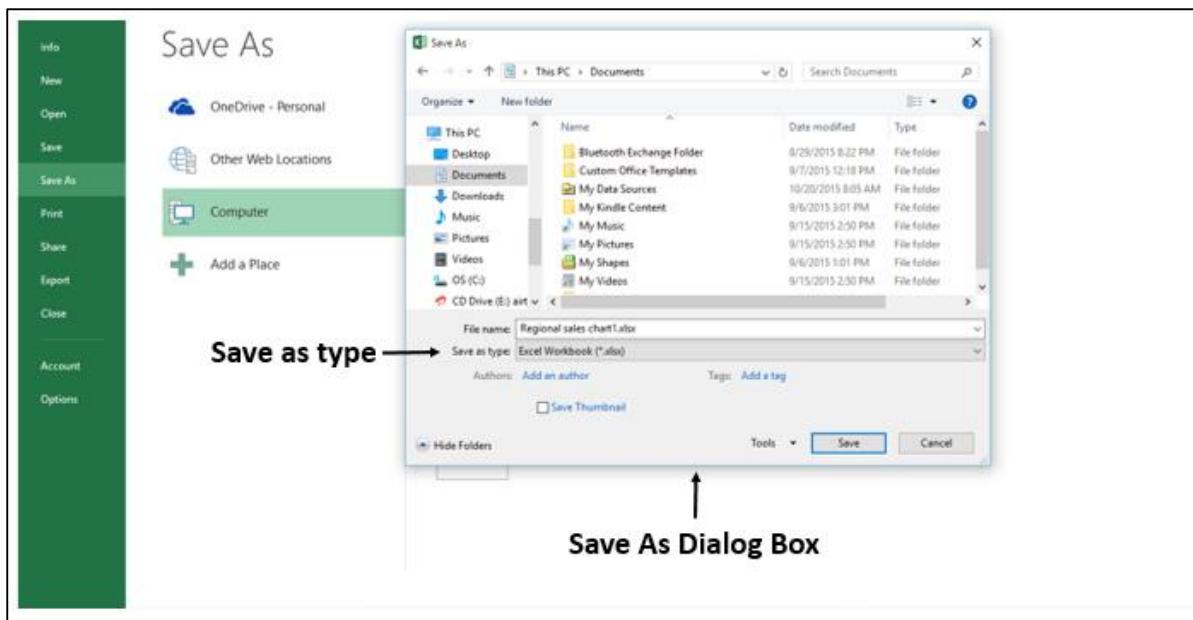
Step 1: Select the **File** menu.

Step 2: Click on the option **Save As**. You get a choice of places to save the Workbook, both on local devices (e.g. Computer) and internet (e.g. OneDrive).

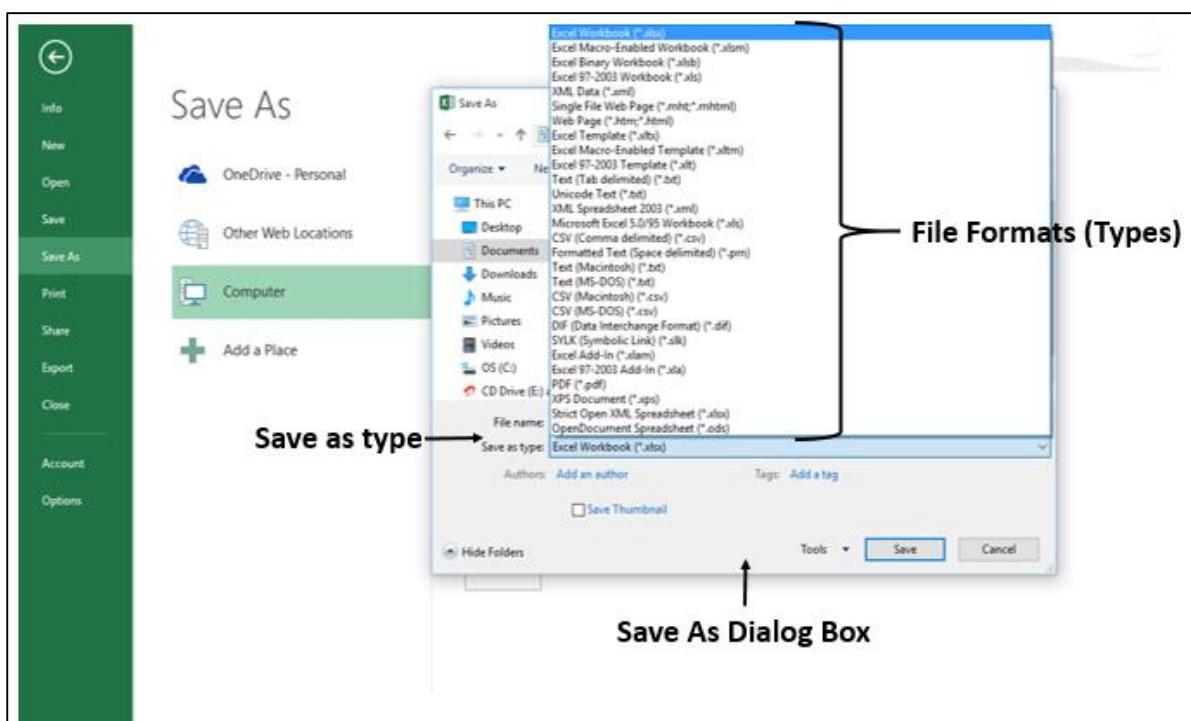
Step 3: Click on **Computer**.



The **Save As** Dialog box opens.



Step 4: Click on **Save As** type. The file formats will be listed.



The file formats displayed depend on the type of active Worksheet in your Workbook (Data Worksheet, Chart Worksheet, or other type of Worksheet).

Step 5: Click on the File Format you want.

File Formats that Use the Clipboard

You can use the Clipboard to copy data to the clipboard in few File Formats, which you can paste into Excel using the command **Paste** or **Paste Special**.

Format	Extension	Clipboard Type Identifiers
Picture	.wmf or .emf	Pictures in Windows Metafile Format (WMF) or Windows Enhanced Metafile Format (EMF). NOTE: If you copy a Windows metafile picture from another program, Excel pastes the picture as an enhanced metafile.
Bitmap	.bmp	Pictures stored in Bitmap format (BMP).
Microsoft Excel file formats	.xls	Binary file formats for Excel versions 5.0/95 (BIFF5), Excel 97-2003 (BIFF8), and Excel 2013 (BIFF12).
SYLK	.slk	Symbolic Link Format.
DIF	.dif	Data Interchange Format.
Text (tab-delimited)	.txt	Tab-separated text format.
CSV (Comma-delimited)	.csv	Comma-separated values format.
Formatted text (Space-delimited)	.rtf	Rich Text Format (RTF). Only from Excel.
Embedded object	.gif, .jpg, .doc, .xls, or .bmp	Microsoft Excel objects, objects from properly registered programs that support OLE 2.0 (OwnerLink), and Picture or another presentation format.
Linked object	.gif, .jpg, .doc, .xls, or .bmp	OwnerLink, ObjectLink, Link, Picture, or other format.
Office drawing object	.emf	Office drawing object format or Picture (Windows enhanced metafile format, EMF).
Text	.txt	Display Text, OEM Text.
Single File Web Page	.mht, .mhtml	Single File Web Page (MHT or MHTML). This file format integrates inline graphics, applets, linked documents, and other supporting items referenced in the document.

Format	Extension	Clipboard Type Identifiers
Web Page	.htm, .html	Hypertext Markup Language (HTML). NOTE: When you copy text from another program, Excel pastes the text in HTML format, regardless of the format of the original text.

File Formats not Supported in Excel 2013

Excel 2013 does not support the following File Formats anymore and you cannot open or save files in these File Formats.

Format	Extension	Clipboard Type Identifiers
Excel Chart	.xlc	Excel 2.0, 3.0, and 2.x file formats
WK1, FMT, WK2, WK3, FM3, WK4	.wk1, .wk2, .wk3, .wk4, .wks	Lotus 1-2-3 file formats (all versions)
Microsoft Works	.wks	Microsoft Works file format (all versions)
DBF 2	.dbf	DBASE II file format
WQ1	.wq1	Quattro Pro for MS-DOS file format
WB1, WB3	.wb1, .wb3	Quattro Pro 5.0 and 7.0 for Windows.

If you have to work with your Workbook data in a program that is not supported anymore, try the following:

- Search the web for a company that makes File Format Converters for File Formats that are not supported by Excel 2013.
- Save your Workbook to another File Format that can be opened in the other program. For example, save to an XML spreadsheet or text File Format that the other program might support as well.

28. Excel – Discontinued Features

Discontinued / Changed features

So far, you have seen the features that are added in Excel 2013. You also need to be aware of the:

- features existing in earlier versions of Excel that are no more available in Excel 2013, and
- the changed functionality in certain cases

Save Workspace

The **Save Workspace** command is no longer available in Excel. This command was used in earlier versions of Excel to save the current layout of all windows as a workspace. However, you can still open a workspace file (*.xlw) that was created in an earlier version of Excel.

New from Existing

In the earlier versions of Excel, the **New from Existing** option, which you get when you click **File** and then click **New**, let you base a new file on an existing one. This option is no longer available. Instead, you can open an existing Workbook and save it with a different file name.

- **Step 1:** Click on **File**.
- **Step 2:** Click on **Save As**. In the **Save As** dialog box give a different file name.

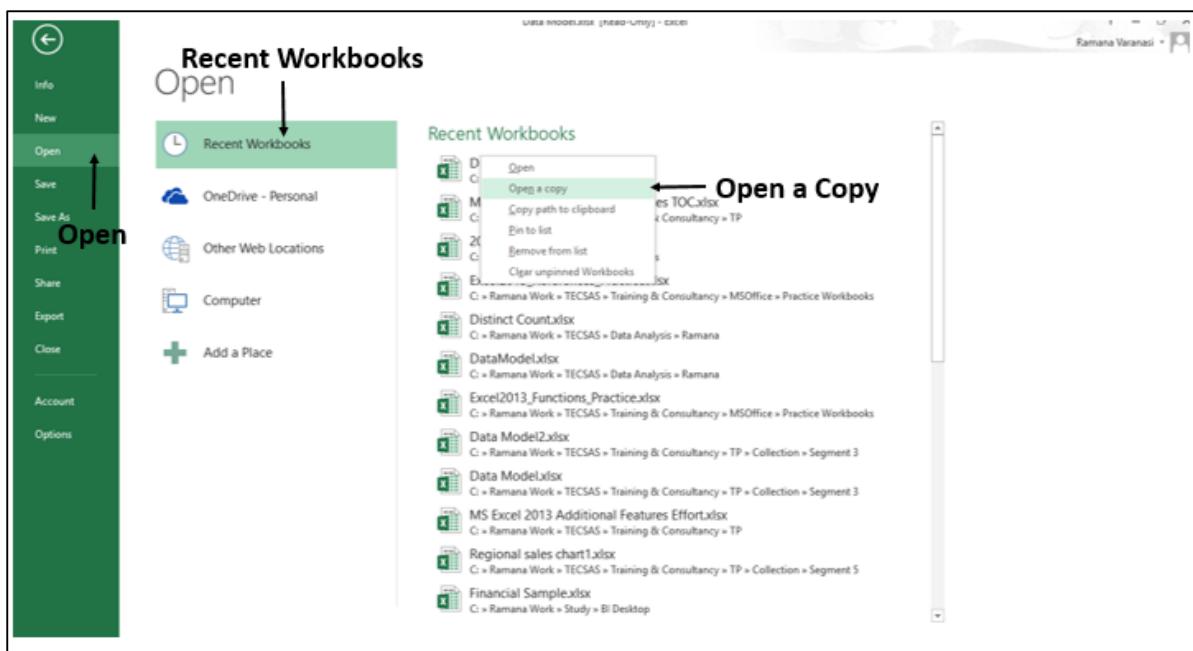
Alternatively, check if the workbook you want to use is in the **Recent Workbooks** folder.

- **Step 1:** Click on the **File** menu.
- **Step 2:** Click on **Open**.
- **Step 3:** Click on **Recent Workbooks**.

If the file is available there,

- **Step 4:** Right-click on its **file name**.
- **Step 5:** Then Click on **Open a Copy**.

Excel creates a copy of the file by adding a number to the file name. You can save the Workbook with a different file name as needed.



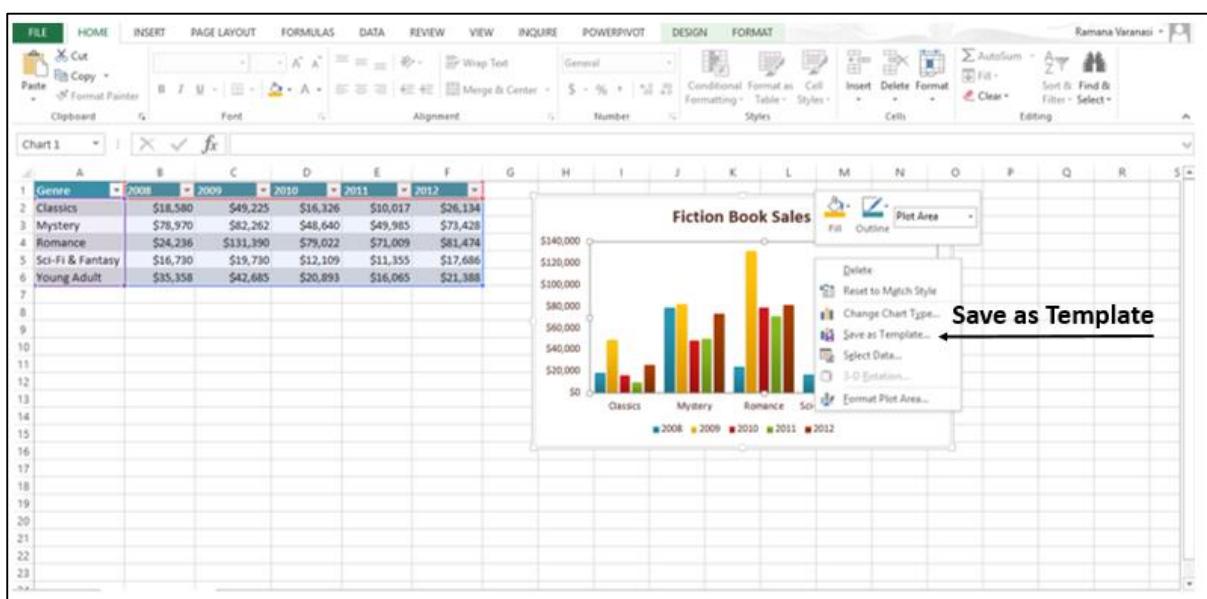
Save as Template

In the earlier versions of Excel, you can save a chart as a template on the **Chart Tools** ribbon by following the steps: **Chart Tools -> Design -> Type**.

In Excel 2013, Save as Template is no longer available on the Ribbon. To save a chart as a template –

Step 1: Right-click on the **Chart**.

Step 2: Click on the **Save as Template** option.



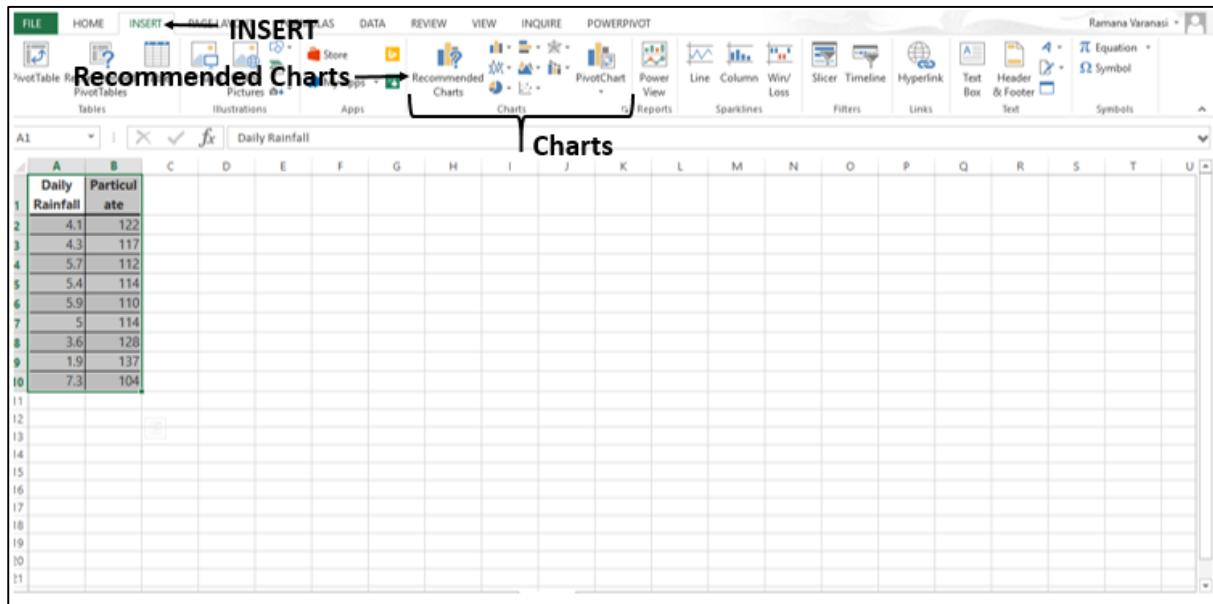
Excel saves the chart as a **Chart template (*.crtx)** in the default Microsoft Templates folder.

You can use it to create a Chart or change a Chart Type.

Step 1: Select a Data Table.

Step 2: Click on the **INSERT** tab on the Ribbon.

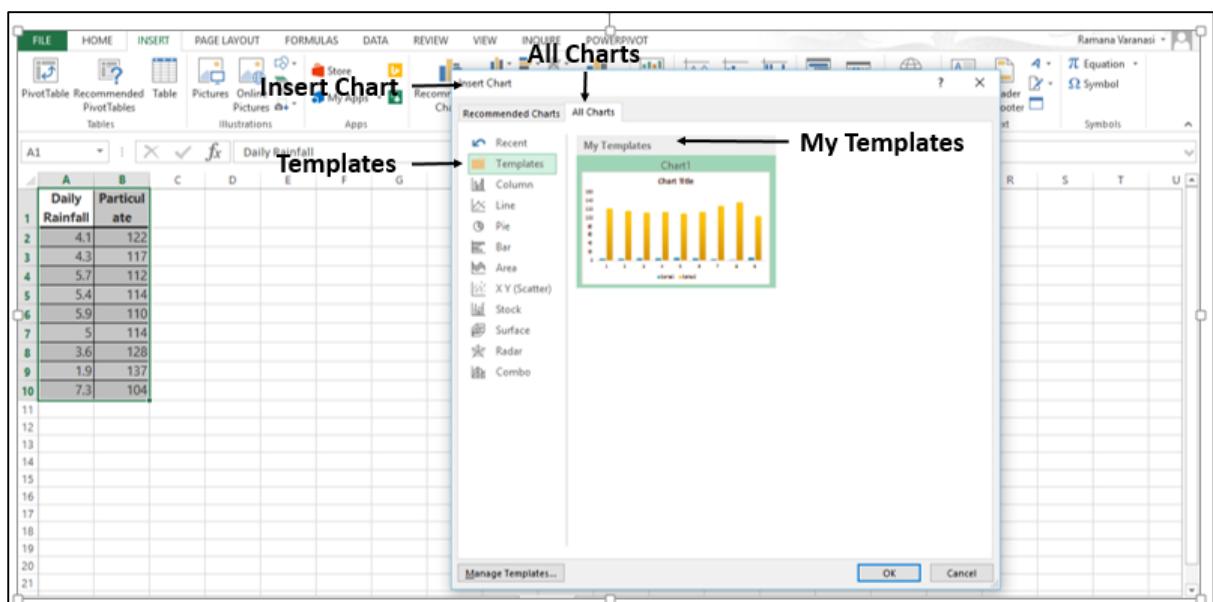
Step 3: Click on **Recommended Charts** in the **Charts** group.



The **Insert chart** window appears.

Step 4: Click on the **All Charts** tab.

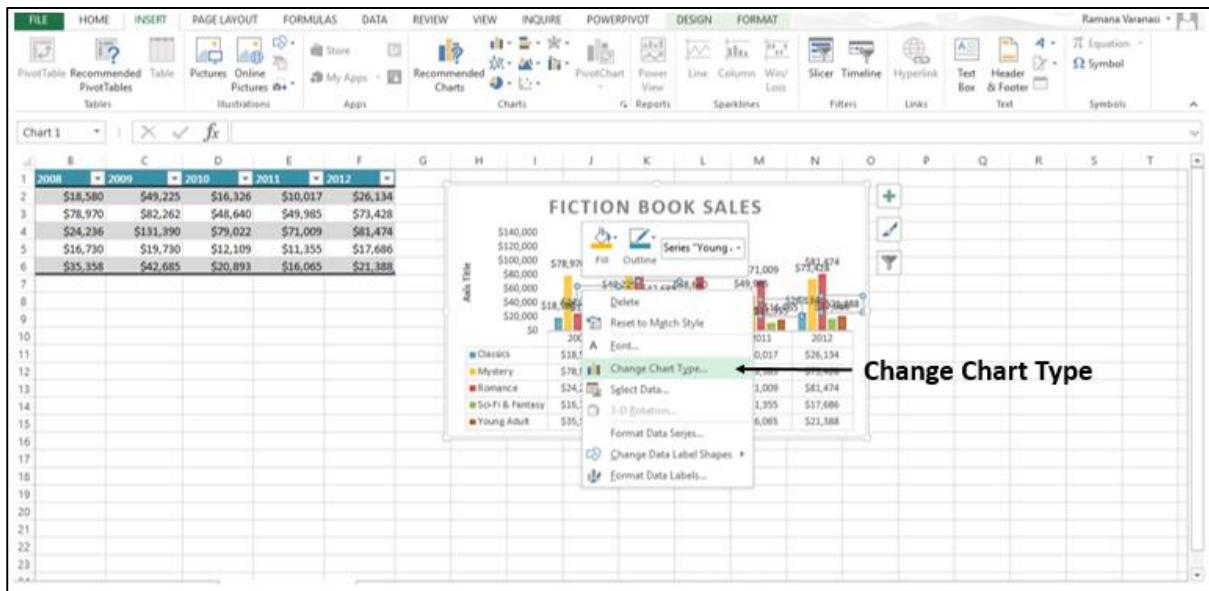
Step 5: Click on **Templates**. Under the Header **My Templates**, your **saved Chart Templates** will be displayed.



Similarly, to change a **Chart Type**:

Step 1: Right-click on a Chart.

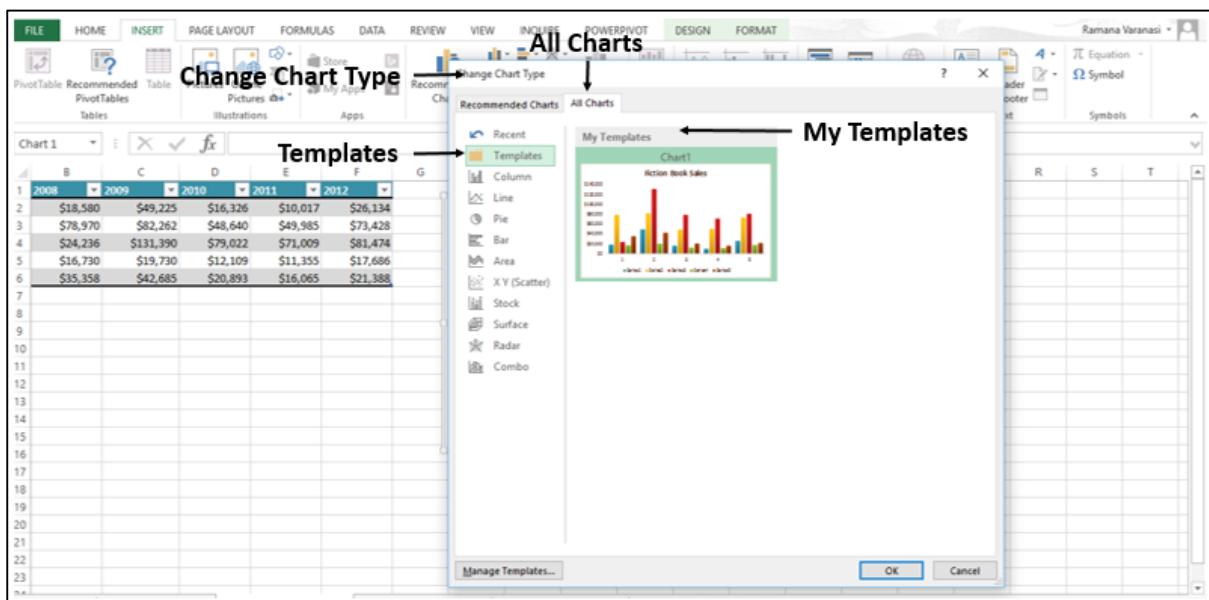
Step 2: Click on **Change Chart Type**.



The **Change Chart Type** window appears.

Step 3: Click on the **All Charts** tab.

Step 4: Click on **Templates**. Under the Header **My Templates**, your saved Chart Templates will be displayed.



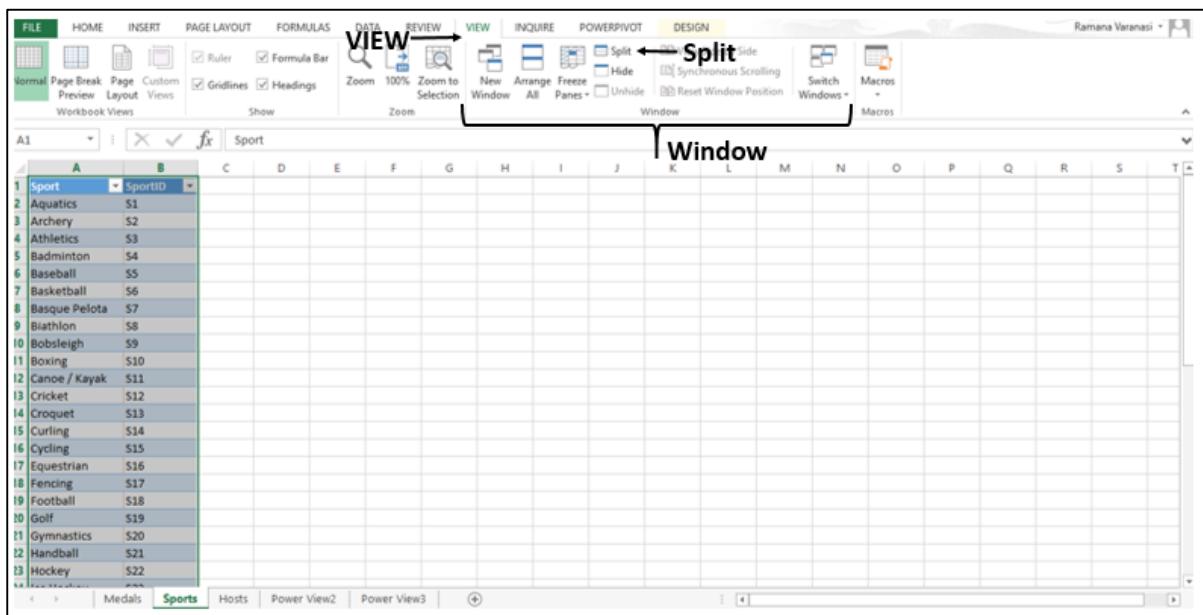
Split Box Control

You used the **Split Box Controls** on the worksheet to split the window into panes at any position on the Worksheet in earlier versions of Excel. In Excel 2013, **Split Box Control** is removed.

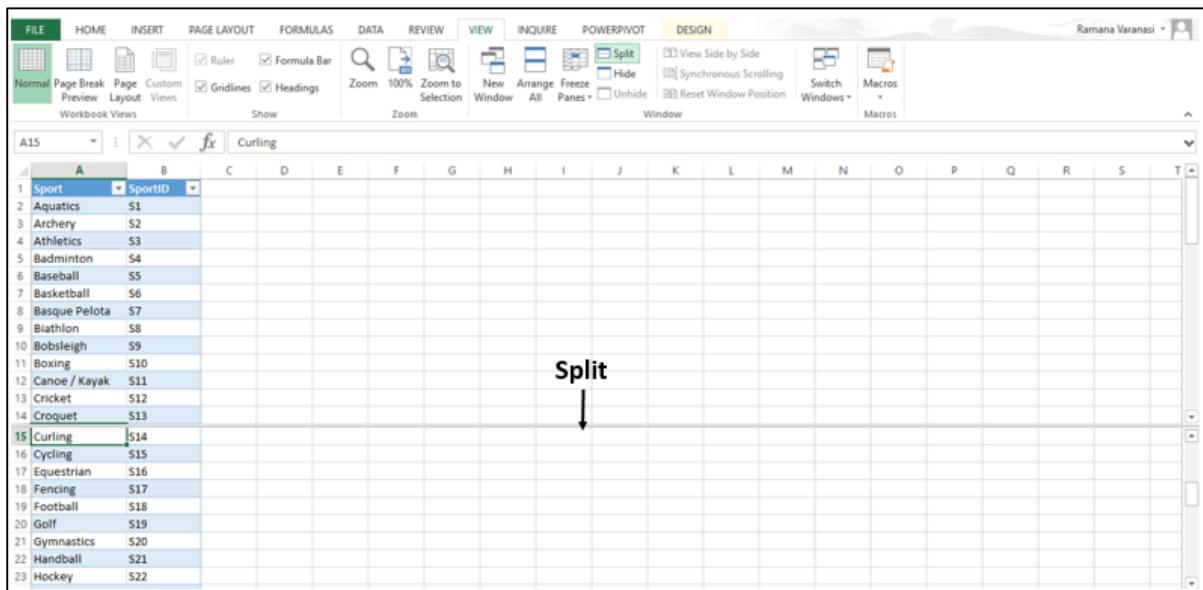
Instead, you can use the **Split Command** on the ribbon.

Step 1: Click on the **VIEW** tab on the Ribbon.

Step 2: Select the cell where you want to place the **Split**. Click on **Split** in the **Window** Group.



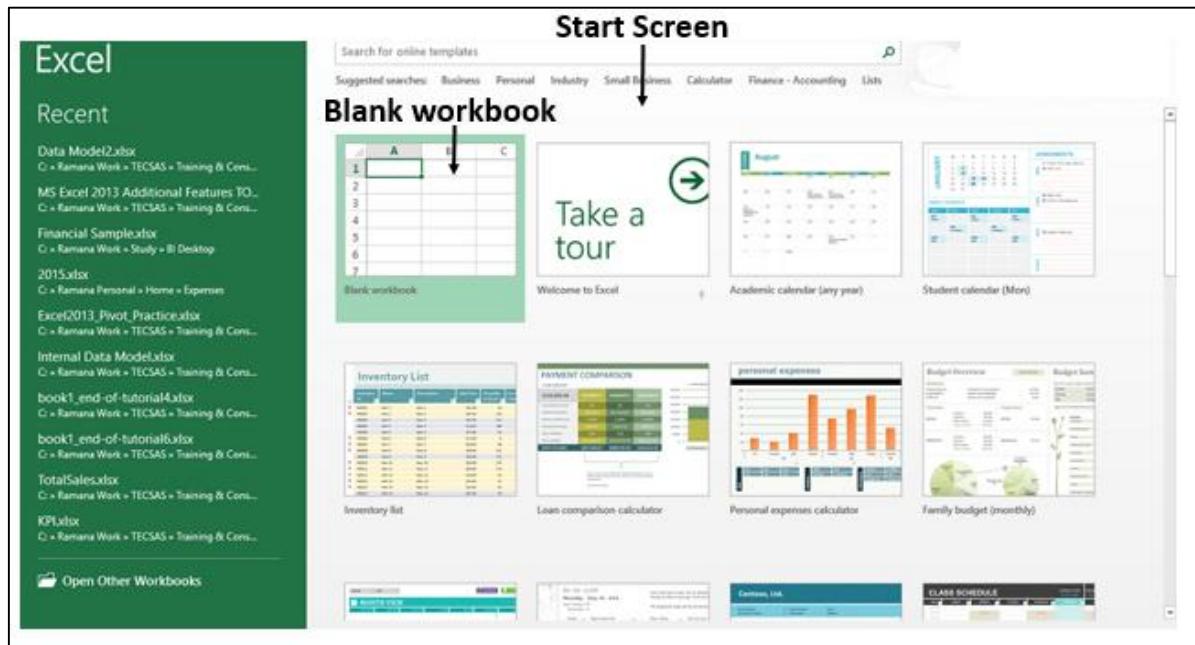
The **Split** appears. As earlier, you can drag a **split** to **reposition** it, and double-click a **split** to **remove** it.



Blank Workbook

In the earlier versions of Excel, when you saved the Workbook settings, you frequently used a Workbook template called **Book.xlsx** that is stored in the **XLStart** folder. This template would open automatically when you created a new blank Workbook.

When you start Excel 2013, the Start screen appears and Excel does not open a **new Workbook** automatically. The blank Workbook, which you click on the start screen is not associated with **Book.xlsx**.



You can set up Excel to open a new **Workbook** automatically that uses **Book.xlsx**:

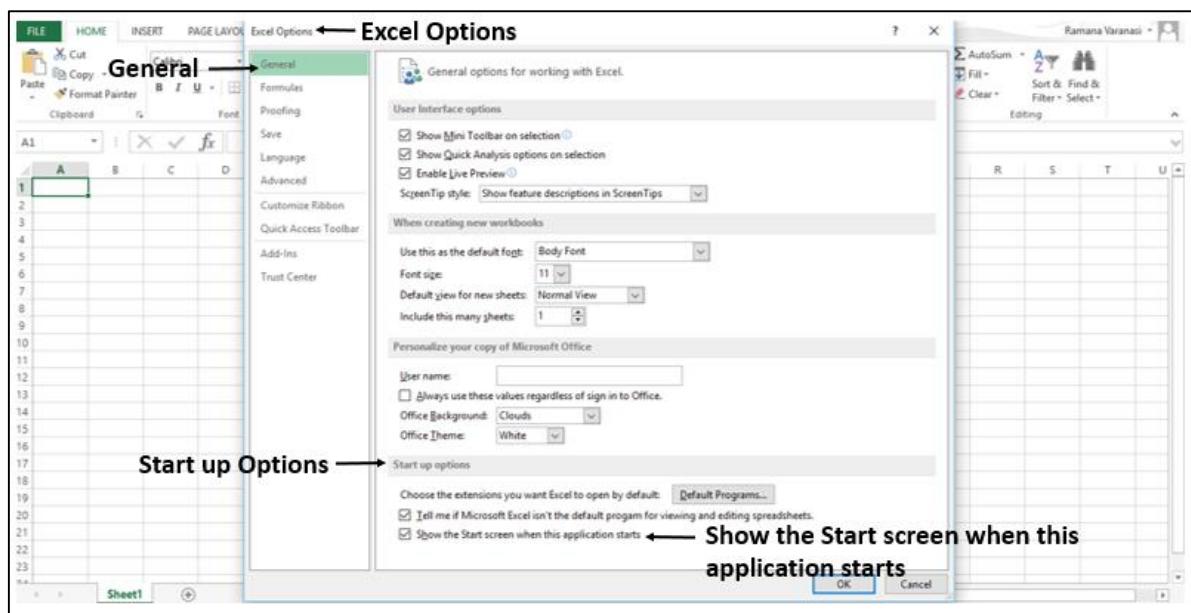
Step 1: Click on **File**.

Step 2: Click on **Options**. The **Excel Options** window appears.

Step 3: Click on **General**.

Step 4: Uncheck the **Show the Start screen when this application starts** box under the **Start up** options.

The next time you start Excel, it opens a Workbook that uses **Book.xlsx**.



Save Options

In the earlier versions of Excel, when you saved a Workbook as a template, it automatically appeared in the **My Templates** folder under the **Available Templates**.

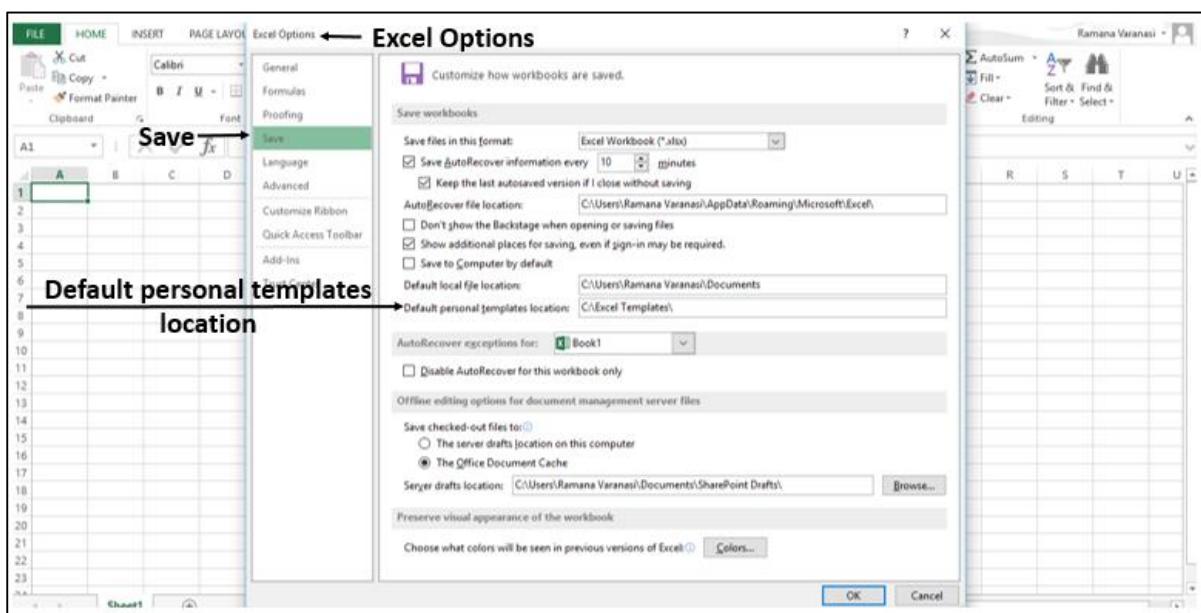
In Excel 2013, when you save a Workbook as a template, it will not automatically appear as a personal template on the new page.

Step 1: Click on the **File** tab.

Step 2: Click on **Options**.

Step 3: Click on **Save**.

In the default personal templates location box, enter the path to the templates folder you created.



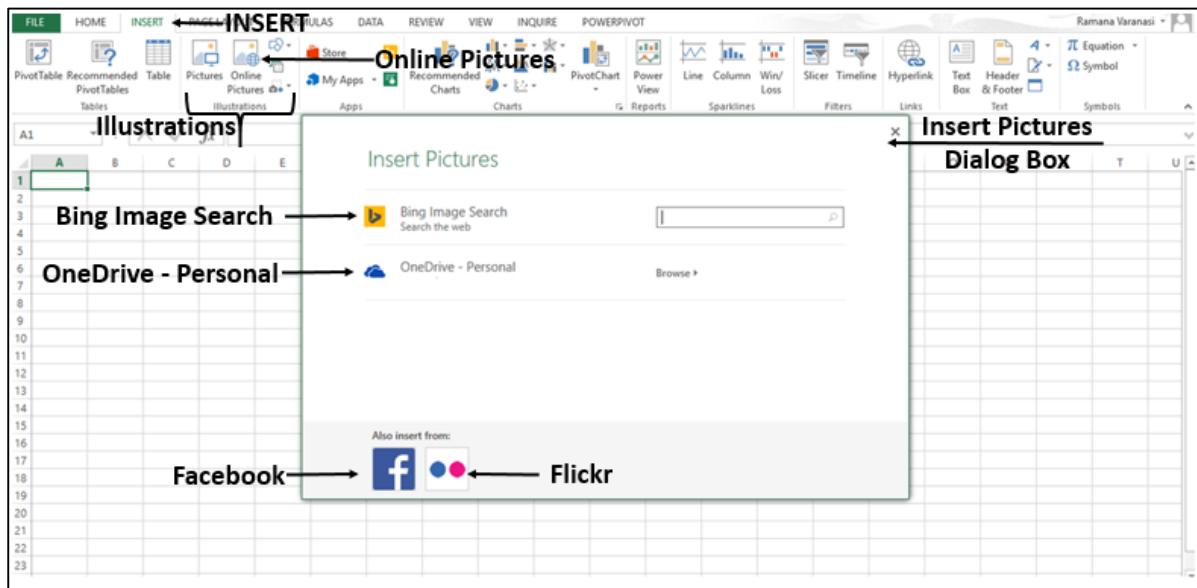
Microsoft Clip Organizer

Microsoft Clip Organizer is no longer included in Office 2013. The Clip Organizer feature is replaced by the **Insert Pictures** dialog box (**Insert > Online Pictures**). This new Insert Online Pictures feature lets you find and insert content from the Office.com Clip Art collection and other online sources, such as Bing Image/Video search, Flickr, and your OneDrive or Facebook page.

In Excel 2013, Microsoft Clip Organizer is not included. Instead, you can insert Pictures from online sources such as Bing Image Search, Flickr, your OneDrive, and Facebook.

Step 1: Click on the **INSERT** tab on the ribbon.

Step 2: Click on the **Online Pictures** button in the **Illustrations** group. An **Insert Pictures** dialog box opens.



Step 3: Select the picture from any of the sources.

MS Office Picture Manager

Microsoft Office Picture Manager is removed.

Exit option

In the earlier versions of Excel, you can exit Excel and close all the open workbooks at once. This was causing confusion among the different close and exit commands in **Backstage View**. Hence, it is removed.

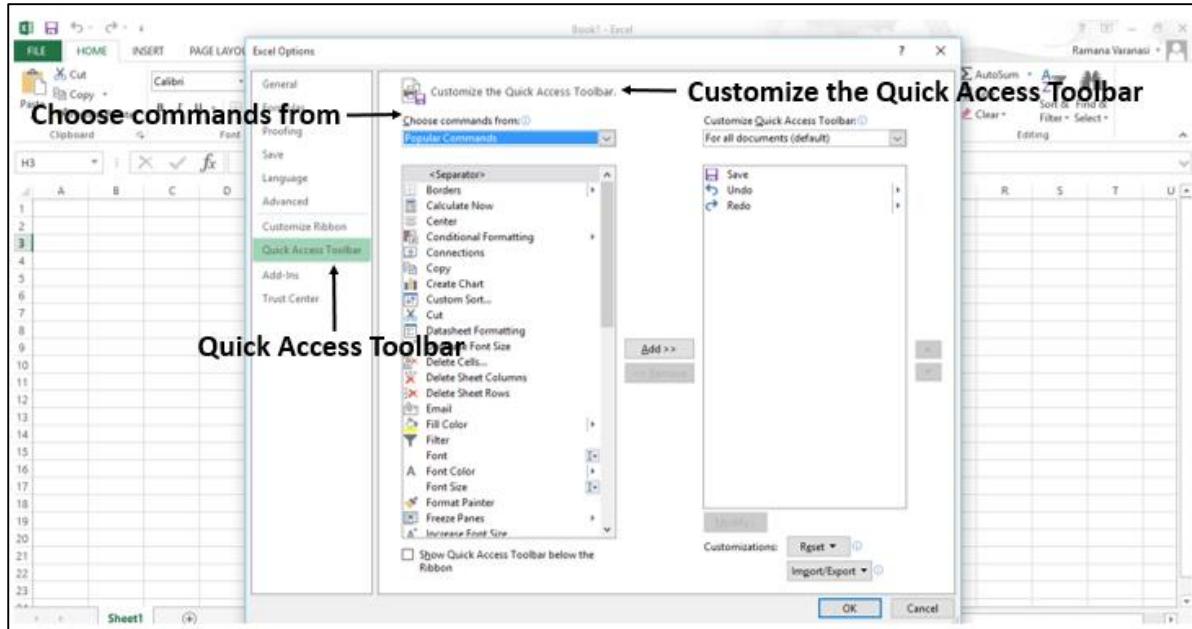
Clicking on the **File** menu and then the **Close** option or the **Close button** (in the upper-right corner of the application window) closes the workbooks one at a time. If there are many open workbooks and you want to close all at once, it is time consuming because you can close only one workbook at a time.

If you want the **Exit** command available to you, you can add it to **Quick Access Toolbar**.

Step 1: Click on the **File** tab.

Step 2: Click on **Options**.

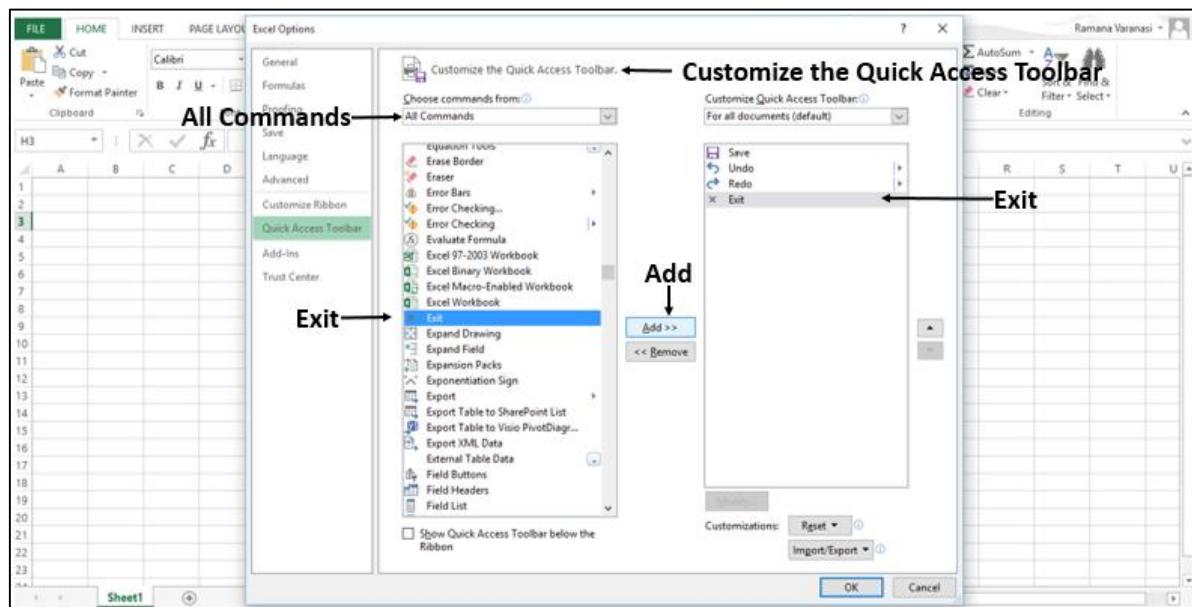
Step 3: In the **Excel Options** window, click on the **Quick Access Toolbar** in the left pane. The option **Customize the Quick Access Toolbar** appears in the **Right pane**.



Step 4: In **Choose commands from:** select **All Commands**.

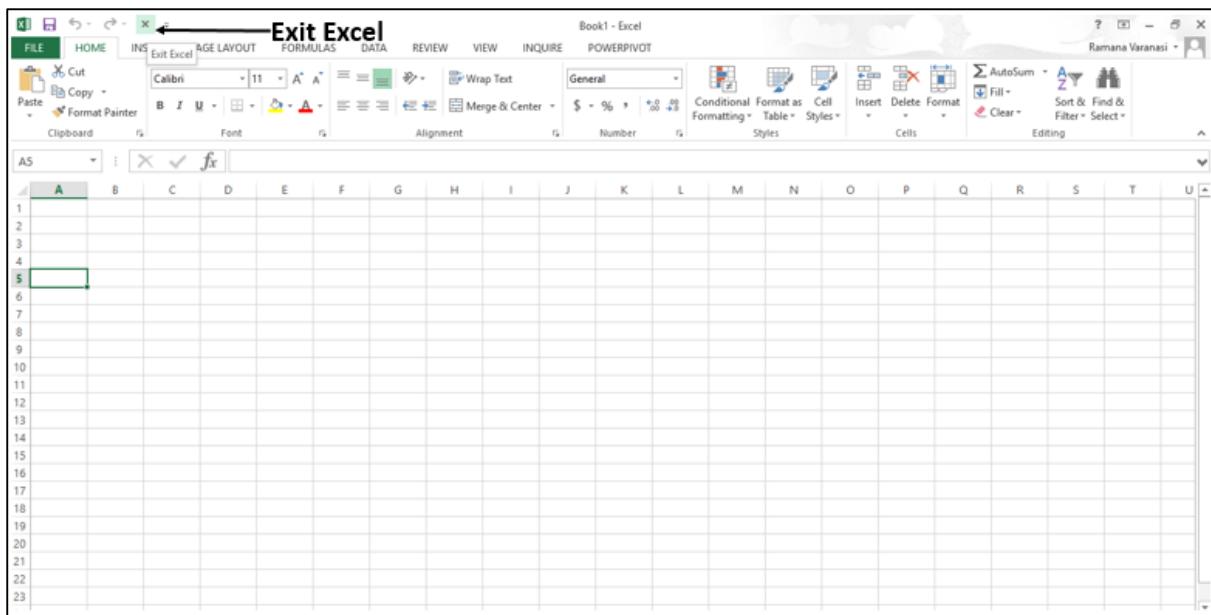
Step 5: Select **Exit**.

Step 6: Click on **Add**. The **Exit** command is added to the list on the right side.



Step 7: Click on **OK**.

The **Exit** Command appears on Quick Access Toolbar.



Step 8: Click on the **Exit Excel** command. All the open workbooks close at once.

Browser View Options

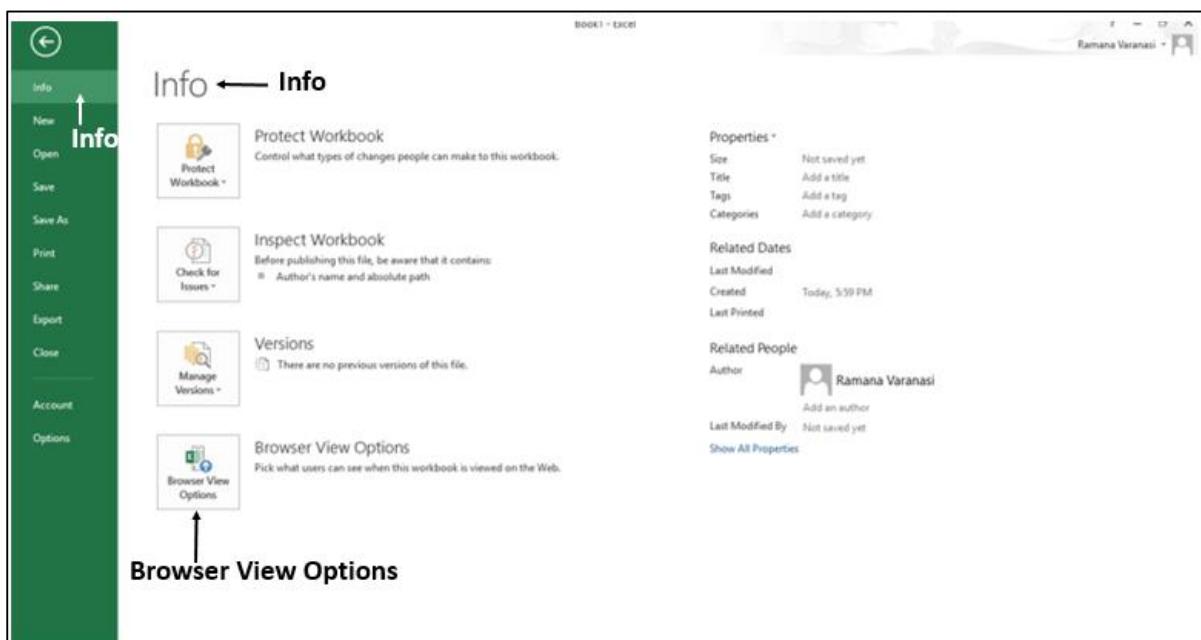
Earlier, when saving a workbook to the web, you used to set how users will see your workbook when they view it. These options used to be in the **Save As** dialog box when you saved a workbook to SharePoint.

In Excel 2013, first you need to set the **Browser View** options.

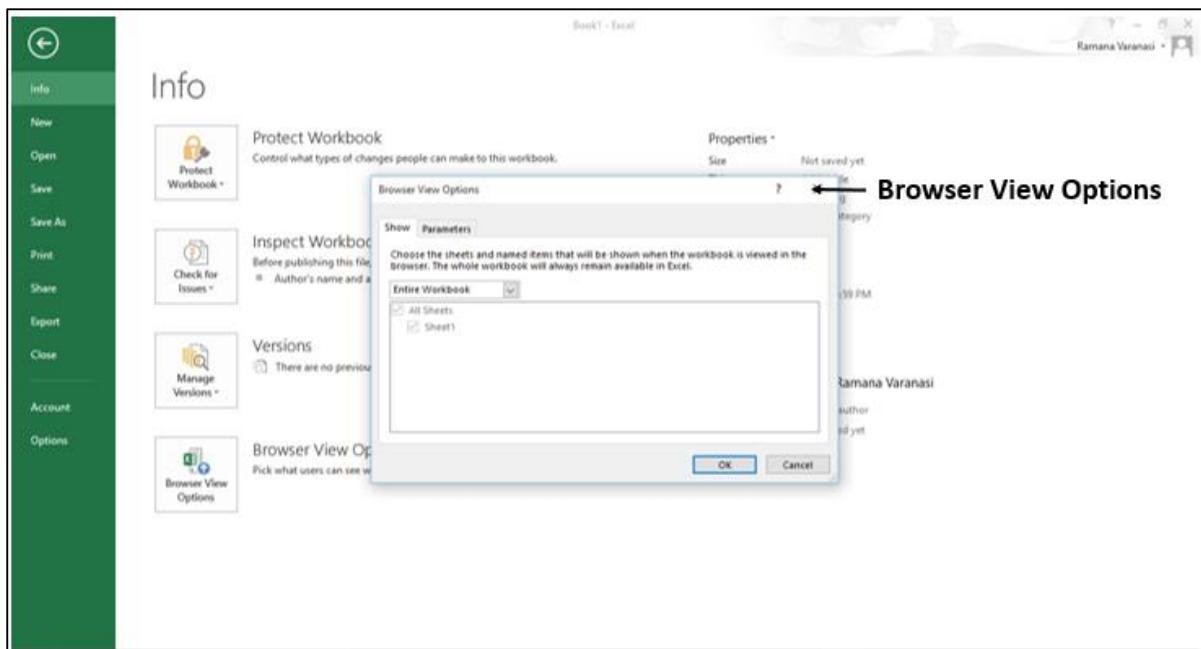
Step 1: Click on **File**.

Step 2: Click on **Info**.

Step 3: In the **Info** pane, click on the **Browser View Options**.



Step 4: In the **Browser View Options** window, select the **options**.



Step 5: Save the workbook to any web location.

Individual Data Series

In the earlier versions of Excel, you could change the Chart type of an individual data series to a different Chart type by selecting each series at a time. Excel would change the Chart type of the selected data series only.

In Excel 2013, Excel will automatically change the Chart type for all data series in the Chart.

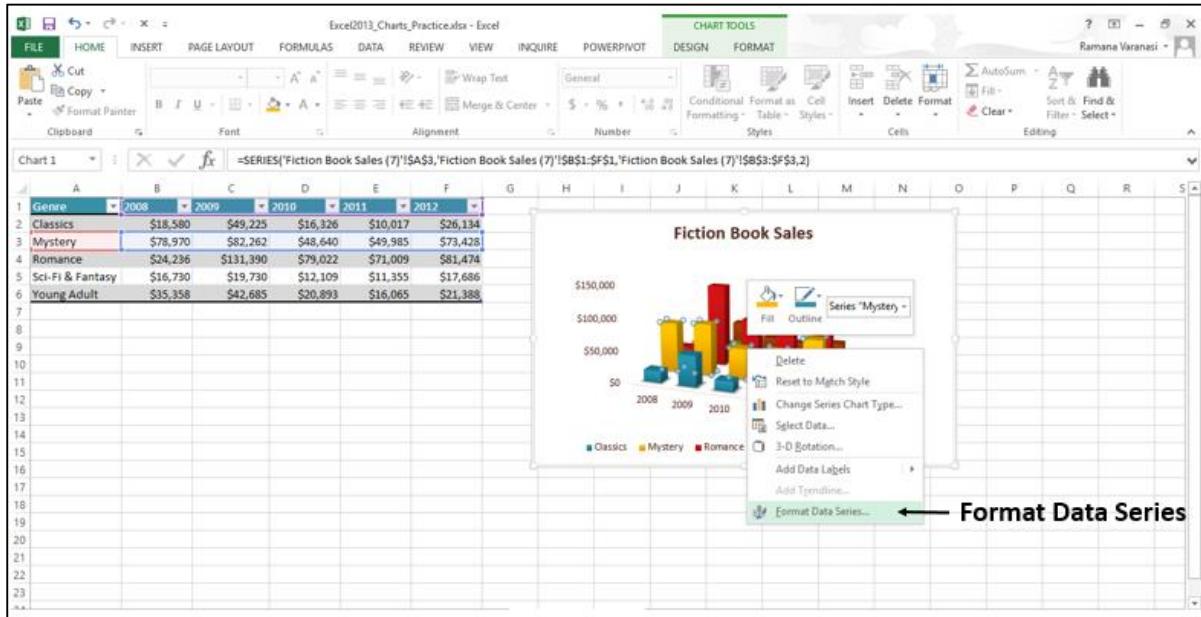
Pyramid and Cone Chart Types

The Column and Bar Charts are removed from the **Pyramid** and **Cone Chart** types in the **Insert Chart** and **Change Chart Type** dialog boxes.

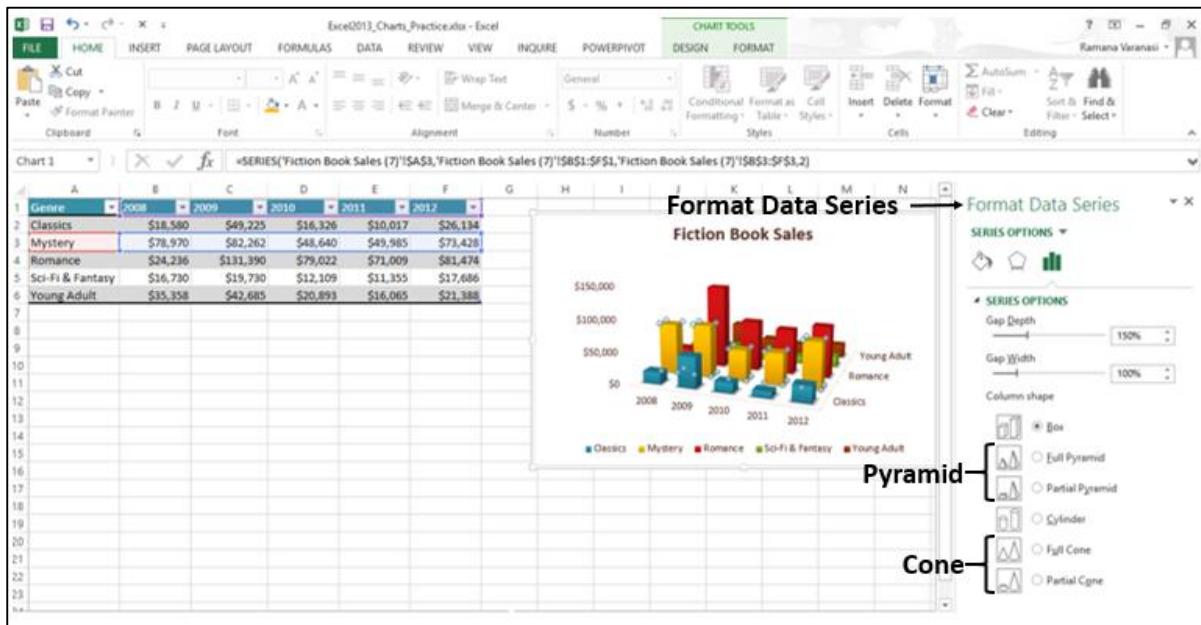
However, you can apply Pyramid and Cone shapes to any 3-D Column or Bar Chart.

Step 1: Right-click on the **3-D Column** chart.

Step 2: Click on **Format Data Series**.



Step 3: Select the shape you want.



The required format will be displayed.